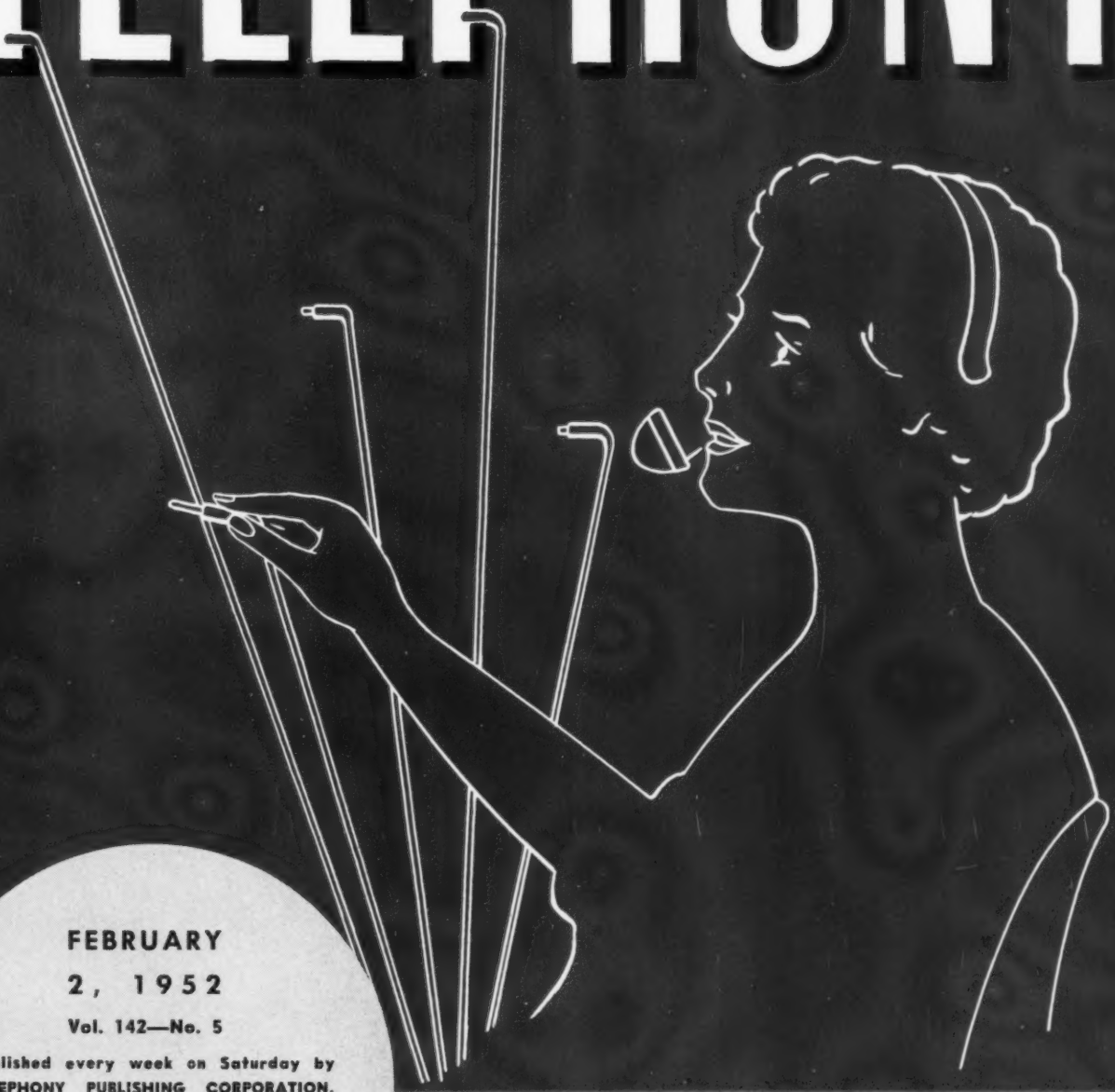
TELEPHONY



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THE JOURNAL OF THE TELEPHONE INDUSTRY

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2 What is Required for Future Expansion?

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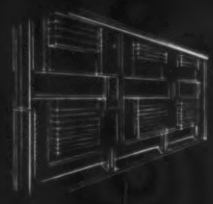
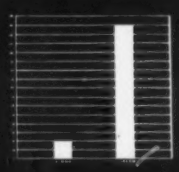


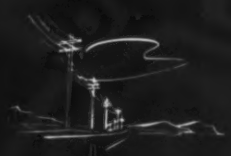
3 What Will Maintenance Cost?

Did you know that a system employing single contacts has a ratio failure of 1 in 10,000; whereas, in a system with *twin* contacts, the ratio drops 'way down to 1 in 100,000?



4 Can Toll Traffic Be Adequately Handled?

Toll traffic is ever-increasing, which means that the dial switching equipment should provide 100% toll access to all connecting paths.



5 What Happens When Subscribers Move?

Your dial switching equipment should provide adequate means for handling this ever-present problem. Will the system of your choice provide the best method?

Your nearest Stromberg-Carlson representative will be glad to discuss these problems with you.

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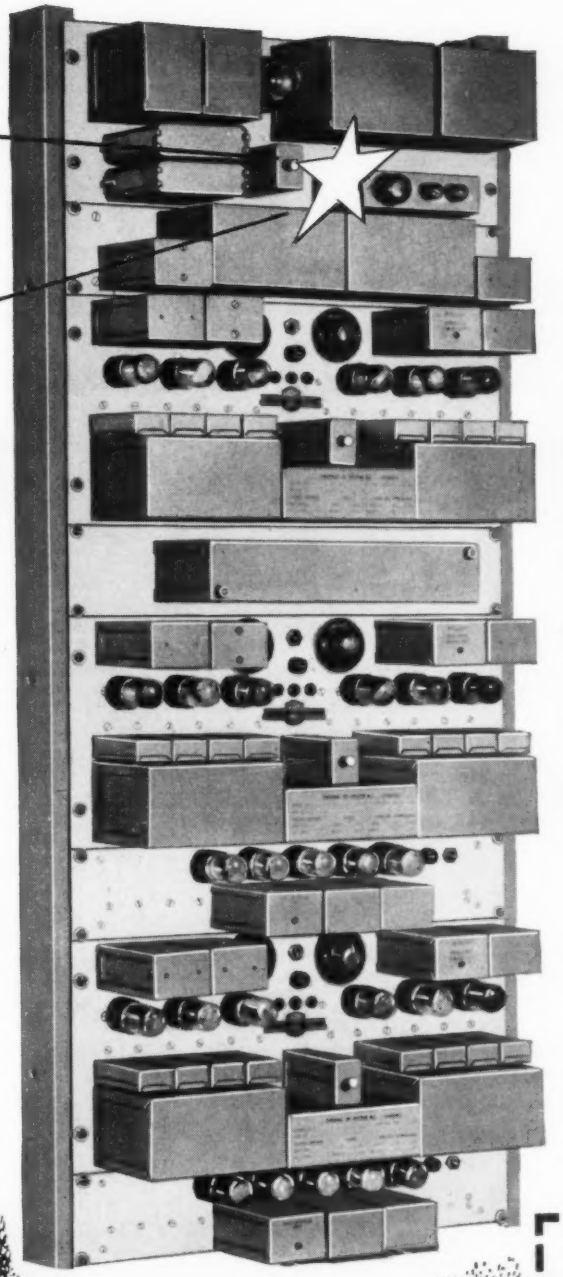

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FLASHES AND PLUGS

UNCLE SAM—THE WINNAH. Kent C. Freeland, Boyne City, Mich., can deduct an extra 5 cents from his 1951 income tax, but he isn't going to do it.

Not after the nightmare of correspondence he had with the Internal Revenue Bureau over the nickel in the first place.

Back in 1950 Freeland, a school teacher, filed his income tax return and sat back waiting for his refund check.

Instead of getting just one check for $60, Freeland got two. Knowing that the government would want its extra $60 back sooner or later, he deposited the second check in the bank for safekeeping.

Sure enough, Uncle Sam wanted his money. So Freeland sent a check for $60.

But the Internal Revenue office at Kalamazoo, Mich., cried "foul." Since he had use of the money, the office wrote, the government would appreciate $2.60 in interest.

Freeland didn't think that was quite cricket, but decided to pay the amount rather than get into more fuss.

The internal revenue office thanked him for the $2.60, but added that he owed another nickel in interest for the added time from the first notice.

This got Freeland's dander up. He fired back a letter saying "no." The government came back saying "yes." This went on for three letter exchanges.

Freeland was fighting a losing battle because he had to pay for his stamps while the Internal Revenue Bureau used its free stamping privilege.

So he surrendered and dropped a nickel in the mail.

Then came a letter from Deputy Collector P. J. Nottoli. It said in part:

"Inasmuch as the amount is too small to process, and since we consider your account as fully paid, the writer has taken the liberty of sending the five cents to the Salvation Army as a contribution from you. . . .

"Since your remittance was postmarked Dec. 31, you are entitled to claim this contribution as a personal deduction on your 1951 income tax return."

Not on your life, says Freeland.

• • •

IT'S A CHILD. Nurses at the national health service maternity hospital in Derby, England, are forbidden to tell new fathers the sex of their babies over the telephone. Miss E. P. Rook, the matron, who banned the practice "in the interests of parents and as a safeguard for the staff," said:

"Twice fathers mis-heard the news over the telephone, probably due to their agitated state of mind, and they were most upset later to discover they were fathers of girls and not boys. One father had sent out shoals of telegrams announcing a son and heir which he earnestly desired and was angry with us when he discovered it was a girl."

• • •

SPELLBOUND. A long distance operator reported this bit of conversation that took place recently. Her customer said, "Long distance? I want to place a call to Skamokawa, Washington."

"How do you spell that please?" the operator said.

"Good heavens, operator, if I could spell it, I'd write."

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

February 2, 1952

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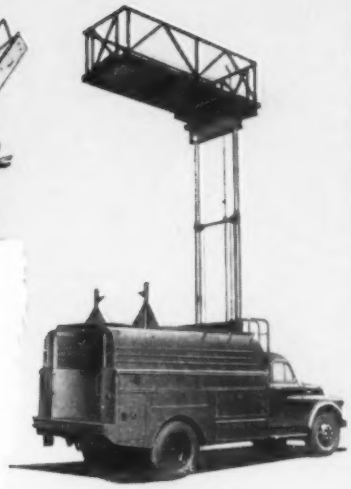

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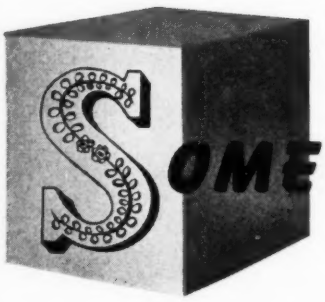

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It's a sorry situation when a telephone company invests its hard earned money in a dial switchboard and finds that it is necessary to discard that switchboard because the exchange has grown beyond its capacity.

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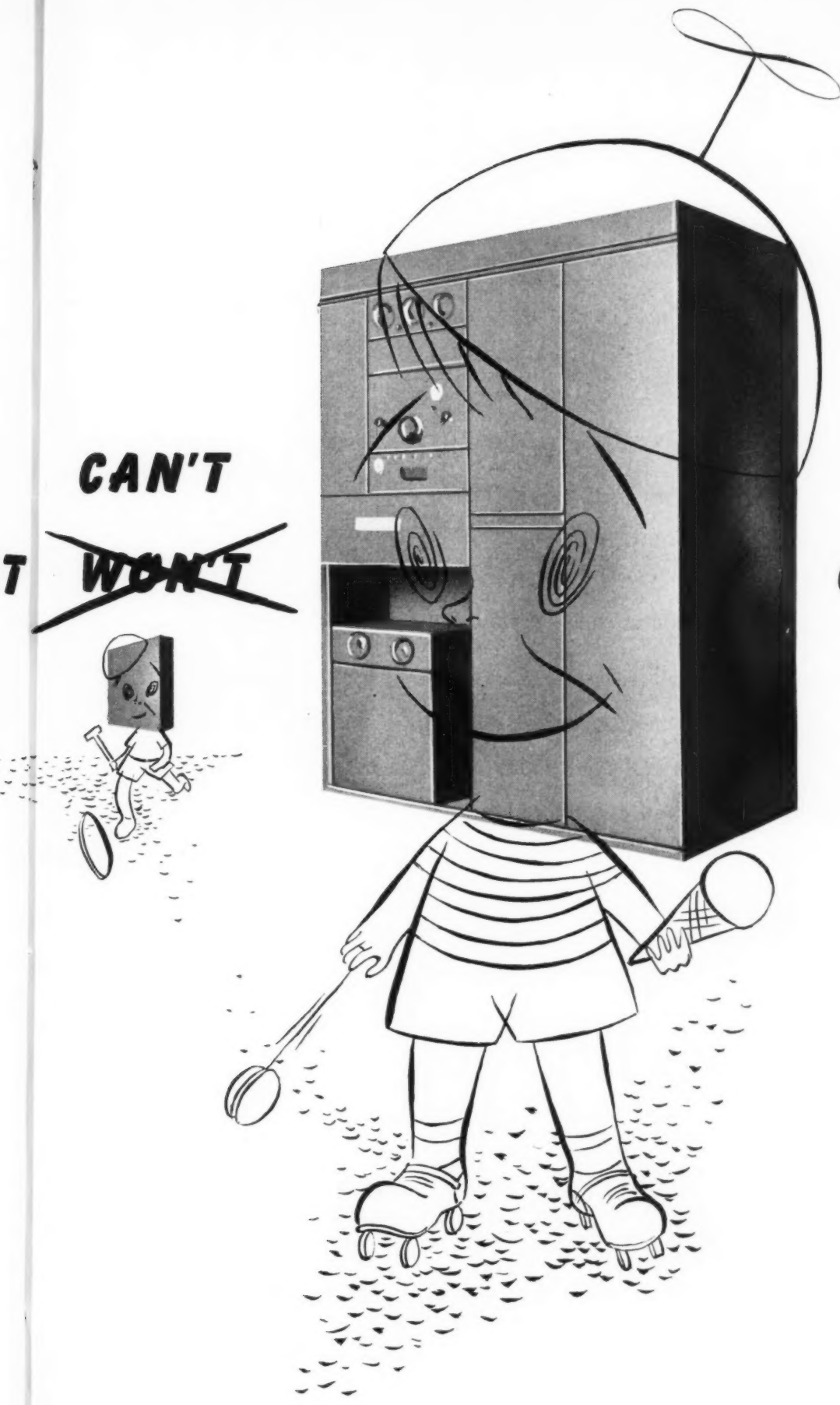

LEICH MANUFACTURERS OF TELEPHONES, SWITCHBOARDS AND RELATED APPARATUS SINCE 1907

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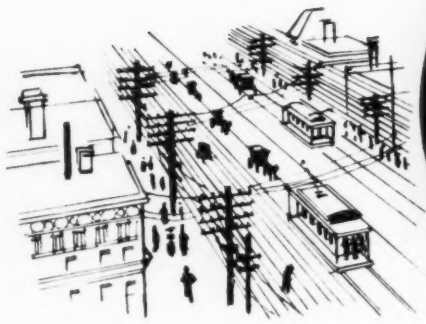

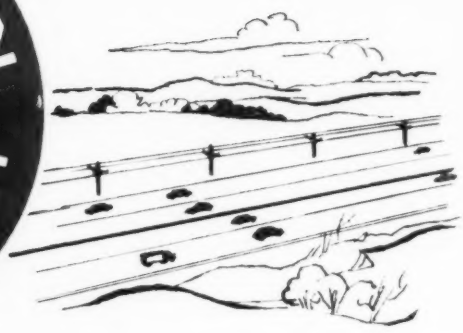

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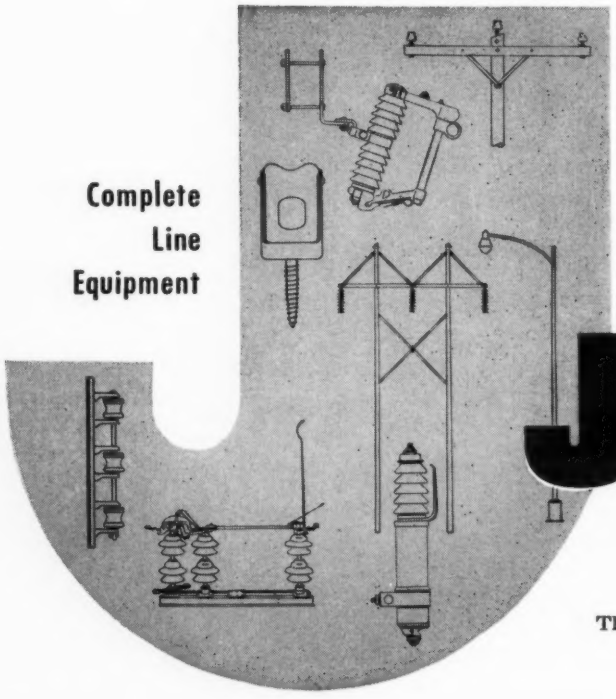

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH
WASHINGTON EDITOR

Rips Illinois Commerce Commission for tying rate of return to cost-of-capital in Illinois Bell rate decision. Holds it puts a premium on debt. Swedish co-op floats a bond issue.

THE recent action of the Illinois Commerce Commission, denying entirely a $22,000,000 rate increase for the Illinois Bell Telephone Co., creates a rather disturbing and discouraging precedent from an important regulatory board in this active period of rate case procedure. One implication of the commission's ruling which is difficult for this observer to understand, is the open invitation by the commission for public utilities to go into debt, and to stay that way.

This runs counter to one of the basic reforms of the New Deal, vigorously preached by the late President Roosevelt when he was running for office for the first time against Herbert Hoover in 1932. It runs counter to the policy of the debt ratio (bonds to stocks) of the Securities & Exchange Commission in administering the Holding Company Act, under which debt ratios of more than 50 per cent have been condemned and disapproved and smaller debt proportions encouraged. It runs counter to the normal and logical regulatory tendency of rewarding thrift, economic management, and conservative financing. The effect of the Illinois commission ruling would be to place a premium on higher debt obligations and a penalty upon any company seeking gradually to liquidate its debt obligations.

Here, in a nutshell, is what the Illinois commission did in turning down the Illinois Bell company's rate increase. The temporary advantages of a high debt ratio and a regulatory limitation of earnings by the commission to the telephone company's cost-of-capital, were two of the featured points, in the long opinion rejecting the rate petition. The commission found that the average cost of Bell System capital had dropped from 6.17 per cent in 1935 to 4.83 per cent at the beginning of 1951. This, it was claimed, would require proportionate intrastate earnings from Illinois Bell's system of only $22,017,000, as compared with $23,000,000 return earned on present rates (5.2 per cent on property cost).

Telephone company witnesses objected that the Bell System's debt ratio, of approximately 50 per cent, is too high and should be reduced to about one-third of the capital structure in order to assure future financial safety. (If this were done, the system companies would require higher rates so as to produce more earnings to meet the higher dividends on stock, as compared with lower bond interest needs, plus the advantage of tax deductions.) But the commission's expert witnesses insisted that company subscribers are *entitled* to economies accruing from the present higher debt capital. The commission agreed that "economy in capitalization was as much an obligation of a public utility as economy in operation."

The commission pointed out that the cost-of-capital to the Bell System is "much lower on the debt portion than on the common stock portion." Of course it is. Objection was raised to the limitation of return to the cost-of-capital, in view of outstanding or prospective debentures being converted to stock. But the commission said it must base its conclusions "on the actual capitalization as of this time and is not relying in this case on any theoretical capitalization urged to be more desirable."

The telephone company witness had advocated a return to the more conservative Bell System practice of keeping debt ratio at about a third of the capital structure. This would be done by a conversion of outstanding debentures (which classify as part of the debt structure) into common stock. But the commission did not like to see the ratepayers lose the immediate advantage of the low-interest rate (on bonds as compared with stock dividends) as well as the deduction for taxes allowed on debt interest payments—both advantages which would accrue to the benefit of the Illinois *ratepayers*, as distinguished from the other federal income *taxpayers*.

The commission said that the company witness' reasons for cutting the debt to one-third "did not take into account the sharp drop in interest rates since the 1920's. His expressed fear that interest rates might rise is in direct contrast to the attitude of Company Witness Stevenson, who testified that the rise early in 1951 was a result only of action by the United States Treasury Department which Stevenson, because of announcements of the Secretary of the Treasury, did not expect to be of continuing effect. *Obviously the decline in interest rates that has occurred since the 1920's makes it possible to increase the proportion of debt without increasing the proportion of earnings needed to pay interest.*" (Italics supplied.)

Another oddity of the commission's reasoning is the suggestion that funds raised for new plant construction ought to be kept in the form of a debt obligation (bonds or debentures) during the period of construction, and transformed into equity (stocks) only after the new plant has been built and put into operation. This is certainly a novel regulatory view. It makes one wonder what the commission would do in a case of electric power and other utilities which simply do not use the convertible debenture method of financing (which is more or less characteristic of the Bell organization). Is utility management to be told by the regulator just what form of financing (stocks or bonds) it should use to raise new money? Here is what the commission said about that:

"The fact that some of the Bell System debentures outstanding are convertible does not warrant special treatment for the amount of capital represented by such securities. These convertible debentures are partly designed to meet the problem caused by the lag in earnings during the time taken to construct property paid for

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with the capital raised from the sale of the debentures. The increased amount of dividends that will have to be paid when these debentures are converted to stock, as compared to present interest charges on these debentures, should be earned by such property now under construction when it goes into service and becomes revenue-producing."

What Others Say About High Utility Debt Ratio

What is the regulatory precedent for keeping utility debt low in proportion to stock? The SEC has often turned down, as a matter of policy, any proposed capital structure under the Public Utility Holding Company Act where the reorganized capitalization would result in a permanent debt margin of more than 50 per cent. A smaller margin has been encouraged and preferred, even in the case of funded debt. The SEC said, in a statement of policy issued in the case of *Re Engineers Public Service Co.*, 37 PUR NS 89:

"Our staff has made a study of the capital structures of a representative group of operating utility companies part or all of whose common stocks are outstanding with the public. It is interesting to note that the capital structures of these operating utility companies have a materially smaller proportion of funded debt to total capitalization and surplus than most subsidiaries of registered public utility holding companies. For the year ending 1939 only two of these operating companies had funded debt to the extent of more than 50 per cent of their total capitalization and surplus. One is a former subsidiary of a registered holding company; the other has no preferred stock outstanding, and by the subsequent conversion of a large amount of convertible debentures into common stock, its funded debt ratio is now less than 50 per cent. The funded debt of eight of these companies amounted to less than 40 per cent of total capitalization and surplus."

The SEC list mentioned shows utility company funded debt structure as low as 27.8 per cent. The SEC gave this added reason for preferring low-debt margin, as a matter of standard policy:

"The dangers of perpetuating a high proportion of debt are well illustrated by the experience of great railroad systems in recent years — experiences which might in many respects have been avoided by financing through a greater proportion of equity securities. . . ."

The late President Roosevelt bitterly condemned, in a campaign speech in Salt Lake City, Sept. 17, 1932, the high debt ratio of the railroads which had plunged most of them into receivership. Railroad debt obligations, mostly bonds, had reached the total of 11 billion dollars, bearing interest of nearly one-half billion a year, and widely held by savings banks, insurance companies, commercial banks and similar institutions. Yet, in the preceding year, Roosevelt was shocked to note, the nation's entire "railroad system, as a whole earned slightly more than its interest charges on this entire group of bonds."

What did he propose to do about it? The remedy was drastic. It had to be. Reorganization, slashing equities and reduction of debt, reclassification of capital structure—all were part of Roosevelt's emergency railroad legislation which Congress later adopted. He said, in his Salt Lake speech:

"I seek to bring the operating balance sheets of the railroads out of the red and put them into the black. In other words, I want the railroads to stand on their own feet, *ultimately to reduce their debts instead of increasing them*, and thereby save not only a great national investment, but also the safety of employment of nearly 2 million American railway workers."

Compare this with the Illinois commission's treatment of Illinois Bell. What good would it do any utility to try to reduce its debt, if the Illinois commission's views on rate-making were widely adopted? The lagging cost-of-money experience, based on fair weather debt financing, would still be used to limit earnings, with a corresponding depressing effect on rates. A period of depression with low earnings would really mean trouble—as it did for the high bonded railroads in the thirties.

Incidentally, only one of the Illinois commissioners, in a brief concurring statement, took issue with the majority view that a utility's permissible rate of return should be tied directly to the price it has to pay for capital. Obviously, the majority was trying, here, to relate its ruling to the language used by the U. S. Supreme Court in the Hope Natural Gas case. In that case the highest court said (51 PUR NS 200):

"Rates which enable the company to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risks assumed certainly cannot be condemned as invalid, even though they might produce only a meager return on the so-called 'fair value' rate base."

Compare this with the words of the Illinois commission, in applying a bare cost-of-capital limit to the Illinois Bell rate of return:

"The commission is determining the level of return on the basis of the amount which the Bell System has paid for equity money in the past and which has been demonstrated to be sufficient to enable it to raise unprecedented amounts of capital. This standard, therefore, would appear to assure a level of earnings sufficient to induce investment of capital."

(Please turn to page 34)

REA Allocates $110,000 To Two Companies

The REA approved $110,000 in telephone loan allocations during the week of Jan. 14 to 18.

On Jan. 15, Hebron (Me.) Telephone Co., was allocated $68,000 for improving and expanding rural telephone service in Oxford and Androscoggin counties. This is the first telephone allocation approved in Maine.

The company now furnishes magneto service to 164 rural subscribers over 40 miles of line. The REA loan will enable the borrower to build seven miles of new line, rebuild 27 miles of existing line, install a new dial exchange at West Minot, convert the Hebron magneto exchange to dial operation, and add 65 new subscribers. There will be no toll charge for calls between the company's two central offices, according to REA.

When the improvements and expansion made possible with REA financing are completed, this telephone system will furnish modern dial service to 229 rural subscribers over 43 miles of line, REA states.

* * * *

Woodstock (Minn.) Telephone Co., on Jan. 18 received a $42,000 loan allocation for extending rural telephone service in Pipestone and Murray counties.

The company now furnishes magneto service to 107 rural subscribers over 40 miles of line. With the REA loan, the company will build 17 miles of new line, rebuild 35 miles of the existing line, convert the system to dial operation and provide service to 49 new rural subscribers, REA reports.

When the improvements and extensions made possible with this loan are completed, the system will be operating 57 miles of line serving 156 rural subscribers with modern dial telephone service, according to REA.

Wire Construction and Maintenance

[**EDITOR'S NOTE:** *This is an address presented by Mr. McKinzie before the Plant Conference at the recent convention of the United States Independent Telephone Association.*]

By J. A. McKINZIE*
Member
USITA Plant Committee

IT IS the purpose of this paper to describe experiences with wire construction and maintenance procedures developed within recent years in an effort to attain the cost reduction goal. In all telephone systems, the wire plant is an essential link between subscribers and the central office for rendering good telephone service to the subscribers. The wire plant needs to be well constructed and properly maintained. At the same time, construction and maintenance costs must be held to a reasonable level to assure a satisfactory return on the investment in the plant. Additional plant facilities, also, must be provided to meet pressing demands for new service connections.

Long Span Construction was introduced some years ago, to reduce construction costs, by providing fewer poles per mile and to decrease maintenance expense by the use of high strength steel line wire, which will stand up under ice loads better than ordinary BB steel wire. In some long span installations, however, the expected savings did not materialize, for the reason that it was necessary to set taller poles to compensate for the increased sags required by the longer spans, and the cost of these poles wiped out the margin of savings that would have been obtained by using fewer poles of standard length.

From the standpoint of economy, long span construction is not well adapted to areas where the terrain is flat or slightly rolling. In locations of hilly terrain, long span construction on two-wire leads can be economical, because standard length poles can be set on hilltops to carry the wires across deep valleys between the poles and clear the heavy growths in the valley bottoms. A few of the spans in such situations are as much as 500 feet long.

Because of the heavy strains encountered in long span construction, much of this type of construction has been limited to two-wire bracket leads. In this case, standard construction (25 poles per mile) in the crossarm lead and long span construction (16 poles per mile) in the spurs from the main lead are employed, when the terrain favors the latter construction.

AUTHOR'S NOTE: Discussions with plant men from various sections of the country who attended the convention of the United States Independent Telephone Association indicated that long span construction is being used considerably throughout the country.

It is regretted that this paper does not reflect the general experience of long span construction which further substantiates savings that can be made under this type of construction.

In addition to the saving in initial cost, it is reported that a number of construction crews have found the high-strength wire easy to handle, and very little difficulty has been experienced, except in individual cases.

The HTL-85 and HTL-135 high strength steel line wires of the 109 mil size have been used in long span construction. The HTL-85 wire has a breaking strength of 793 pounds, and the HTL-135 wire, 1213 pounds. The latter wire can be used in extremely long spans with less sag than corresponding lengths of the HTL-85 wires, but it is difficult and hazardous to handle on account of its extreme stiffness. For this reason, it is not favored by construction crews. HTL-85 steel wire is now employed for both long span and standard construction by many companies.

In long span construction, corners and dead-end points of the lead require adequate guying to properly support the long spans. In straight sections of the lead, it is advisable to reinforce the pole brackets with single bracket clips to prevent brackets on adjacent poles from stripping off, in the event of a break when the wires are loaded with ice. At small angle corners, each bracket on the corner pole is reinforced with two bracket clips. Strain insulators of the proper size are required on the pole at sharp angle corners and at dead ends. The insulators are attached to the pole with eyebolt and clevis assemblies.

In regard to the strain insulators, it has been claimed that strain insulators have a lower leakage resistance than standard glass insulators and are more likely to cause noise pick-up from paralleling power lines.

To prevent burning of the line wires at the insulators, from excessive vibration of long spans in the wind, the wires should be reinforced with the splints at the insulator ties. In the case of wires tied to strain insulators, an armor wrap is used, when tying the wires at this point.

Defective Splices. Many cases of line trouble, resulting in poor transmission, noise, and erratic ringing, are traced to defective splices in line wires. The use of compression type sleeves will positively eliminate trouble of this kind; provided the wire ends are thoroughly cleaned before the splice is made and the required number of crimps are made on the sleeve. Compression sleeves save time and labor, particularly when splicing drop and bridle wire, and inside wire.

The matter of insulating splices, made in drop and bridle wires, is a very important one. To be effective in preventing line leakage, two layers of rubber tape on each splice and two layers of friction tape overlay must be applied. Recently, a plastic form of self-bonding tape has been adopted to replace the standard rubber tape. This tape is resistant to attack by sunlight and ozone and will not deteriorate when the outer friction tape layer is weathered away. It is thought that the use of this tape will considerably extend the life of drop wire splices.

Test Clamps have not been satisfactory for connecting drop wires or spur lines to open wires. If the clamps are not sufficiently tightened when installed, they are very apt to cause noise, resulting in poor transmission. They also tend to "freeze" on the line wires, necessitating their destruction, when opening the line for tests.

Tap Compression Sleeves have been found to give best results, in connecting drop wires and spurs to open wire; also in making party-line taps on drop wire. It is important to crimp the sleeve on the drop conductor or spur wire first and then on the line wire; otherwise the sleeve may be loosened, if the sleeve is crimped on the line wires first. The manufacturer recommends that the sleeve be wrapped with friction tape afterwards, to prevent possible corrosion, but this precaution has not been found necessary. As in the case of straight compression sleeves, the line wires and the ends of the

*McKinzie is general plant superintendent of Lincoln (Neb.) Telephone & Telegraph Co.

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connecting wires should be thoroughly cleaned before making the splice.

Tree Clearance on open-wire lines is the chief item of expense in the smaller exchanges, because of the high labor costs involved in trimming or removing trees by cutting individual branches and trunks. To reduce this high cost, two methods of mass eradication of interfering trees and underbrush have been adopted; namely, clearing the right of way with a bulldozer and killing woody plants with herbicides. When permission cannot be obtained from abutting property owners for these operations, the poles are raked, or side arms placed on the poles, to carry the wires past the interfering trees, or, if possible, an easement is obtained to set the poles on a private right of way free from interfering trees and brush. Tree wire guards have been tried out, but they have proved to be little better than regular tree wire.

It is possible to clear rights-of-way most economically when the road authority (county or state) and the property owner agree to pay equal shares of the clearance cost with the telephone company. The property owner will cooperate all the more readily, when he or his tenant can perform the labor of clearing the right of way in full or partial payment of his share of the expense.

Several methods have been developed for spraying rights-of-way. One method is to spray the entire area of the right-of-way, thoroughly wetting the foliage of trees and shrubs with the herbicide. Standard herbicides, mixed with water, are employed in proportions recommended by the manufacturer of the spray chemicals. This method has disadvantages of requiring the use of high pressure at the sprayer nozzle, in order to throw the spray high enough to cover the foliage. This results in rather considerable spray drift, which may cause damage to adjacent farm crops or valuable trees. Because of the wide coverage, much spraying material is expended. Spraying must be done when the trees and brush are in full leaf and, hence, this work is limited to three or four months of the year.

One spraying procedure makes use of an airplane to spray the right of way much in the same manner as dusting of farm crops with insecticide by a low-flying airplane. In a recent demonstration, a commercial crop duster flew along an osage orange hedge row, one-half mile long and 16 to 20 feet high, spraying the hedge with a herbicide that completely killed the shrubs. The pilot required only 15 minutes, from the time of leaving

J. A. McKINZIE

for the spraying operation, until he returned. Although a field of corn was growing adjacent to the hedgerow, no harm was done to the corn. The cost of spraying right of way by airplane is understood to be $50 per mile in some localities.

Very recently, another method was developed in an effort to reduce the spraying cost. This procedure involves the spraying of the first six inches all around the plant stem above the ground line, rather than spraying the entire plant and its foliage. Because only the base of the stem is sprayed, this operation can be performed at any time of the year, weather permitting, and the killing results are just as satisfactory as in the case of foliage spraying.

A coarse-breaking spray is applied, to avoid the drifting common with high-pressure foliage spraying. The herbicide employed consists of two pounds of 2,4-D and two pounds of 2,4,5-T chemicals in one gallon of glycol. This formula is mixed with No. 2 fuel oil at the rate of one gallon of the formula to 30 gallons of oil. This herbicide, applied as indicated, has produced an 80 per cent kill of common species of woody plants, without affecting grasses growing on right of ways.

The equipment needed for basal spraying is essentially the same as that used for foliage spraying. One form of equipment that has been found satisfactory for extensive spraying operations consists of a trailer-mounted tank of 150 gallons' capacity, gasoline-engine driven pump of the reciprocating type, 100 feet of one-half-inch hose, and a long-handled spray gun to reach the plant base without the operator having to stoop over.

No pressure is maintained within the tank and baffles are provided to prevent damage from surges of the liquid. An agitator keeps the liquid mixture thoroughly stirred. The pump is adjusted to maintain a pressure of 20 to 40 pounds at the output, which is essential to obtain the coarse-breaking spray desired. This kind of a machine costs approximately $550.

For less extensive spraying operations, it is satisfactory to use a small gasoline-engine driven pump of the centrifugal type with a 50-gallon drum and 50 feet of hose. The same type of spray gun, as previously described, is used and this outfit costs approximately $150. It is very economical and satisfactory for exchange forces to use.

Since some resprouting is encountered, the rights-of-way are again covered the next year, and any resprouting plants are sprayed, using the same method as the first time. After this, no further spraying need be done, except as necessary to kill woody growths from seeds. This occasional eradication work can be handled by combinationmen, who are provided with hand-operated sprayers. It is expected that line clearance costs will be substantially reduced over the years by following the foregoing brush eradication program.

When the Rural Electrification Administration was established and began to build power lines to serve rural customer, it was freely predicted that telephone companies would suffer from this invasion. This was true in many cases but the telephone organizations soon learned the basic causes of the power interference and was soon able to correct the conditions through the fine cooperation of the power districts.

Actually, the expansion of the power lines into rural territory may be regarded as a blessing in disguise. Although it was necessary to go to considerable expense to improve the electrical balance of lines, the removal of incidental grounds on the line, mostly due to tree contacts, and the cutting out of high resistance splices brought about marked improvements in transmission and signaling on the lines. Better transposing of the lines, to improve the telephone line balance with respect to the paralleling power lines, also improved the cross talk balance and reduced cross talk trouble in cross-arm leads.

In the past, it had been quite difficult to secure permission from abutting property owners, to remove trees and shrubs in the way of farm lines, in order to keep them free from trouble. Considerable persuasion was often re-

quired to secure the minimum of trimming, possibly one or two feet clearance was all that could be obtained. With the spread of rural electrification, however, property owners, who wished to electrify their farms, soon realized that they could not get dependable electric service, unless the power company's lines were free from contact with their trees. In most cases, the Rural Electrification Administration refused to extend its lines, to serve a customer, until they could be assured of an unobstructed right-of-way for their lines.

As the power customers became more and more dependent on electricity for power and lighting purposes on their farms, those who did not have telephone service found it desirable to subscribe to the service, in order to be able to call for assistance, in case of breakdown of their electric machinery or appliances. These and other subscribers began to consider good telephone service of equal value with reliable electric light and power service. The net result has been that subscribers generally cooperate, when the telephone company finds it necessary to remove interfering trees and shrubs, to keep their lines free from trouble.

Buffer Protection has been used in locations, where considerable trouble is experienced with lightning damage to cable at the junction with open wire, and this protection has practically prevented this trouble. Most of these installations have already paid for themselves, by eliminating cable repairs at junction poles, following lightning storms.

Buffer protection involves the use of auxiliary protectors on the open wires, at least three span lengths and not more than one-half mile away from the junction pole. These auxiliary protectors by-pass the major part of a lightning surge or current from a power line cross to ground, and allow the standard protectors on the junction pole to absorb the remaining energy.

Outdoor protector mountings, with 100-mil air gap protector blocks, are used. A low-resistance ground is considered absolutely essential to the success of buffer protection. To assure this low-resistance ground, five eight-foot Copperweld ground rods are installed 15 feet apart in a row, in a location where the soil is perpetually moist, and the rods are connected to a length of No. 6 gauge WP solid copper wire, which terminates on the ground post of the protector mounting.

No. 14 gauge bridle wires are used for connecting the line wires to the terminals in the protector mounting.

"BILL WORKED OUTSIDE SO LONG THAT THIS WAS THE ONLY WAY HE COULD STAND A DESK JOB."

The connection to the line wire is made on the side of the pole away from the cable terminal, to avoid sharp turns in the wires and afford an easy path to ground. The use of heavy gauge wires, with the minimum number of bends, assures a low-impedance path to ground for the lightning surges.

It is recommended that buffer protection installations be limited to locations of frequent lightning damage and where toll lines are of sufficient importance to warrant this protection, as installations of this kind are rather expensive. Whenever buffer protection is placed, all lines in the lead should have the same protection, to avoid the possibility of lightning or power line surges from entering the cable over the unprotected wires.

Drop Wire as you well know, is the most perishable of all outside plant items. Drop wire represents only 3 per cent of the plant investment of one telephone company and, yet, accounts for 10 per cent of its plant expense. Within recent years, however, tough Neoprene jacketing has replaced the perishable braid covering responsible for the short life of the drop wire, and it is expected that this plant expense item will be reduced to a considerable degree.

Experience with various makes of Neoprene jacketed, as well as Polyethylene insulated drop wires, indicates that it is well to continue the precautions that are taken to prevent abrasion of the wire covering and excessive tension on the wire. Drop wires should be routed, to avoid trees and obstacles in all cases, where possible. The use of span clamps on the cable span helps considerably in this respect, though sometimes the drop wires have to be attached to other points, such as a garage on the subscriber's property, or to a house not on the subscriber's premises, when permission can be obtained to make the attachment. Tree trimming is a last alternative. It is preferable to use plastic drop wire guards to protect the drop wire, if the latter must pass through trees.

Pole-to-pole drop wire runs are especially bad, when there are hedge rows growing along the cable lead, as in alleys. In many cases, the pole-to-pole runs can be reduced to a minimum by installing cable terminals on every pole in the alley lead behind the subscribers' residences; thus making the proper location, of a drop run to avoid obstructions, a simple matter of proper terminal assignment.

It is found that damage to drop wire at drop clamp attachments can be prevented by avoiding excessive tension in the drop spans. Minimum sags are specified for the spans and the wires are required to be strung, to obtain not less than the specified sag for the span length.

(Please turn to page 36)

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MAINTENANCE TESTING EQUIPMENT

By JOHN A. BRACKEN

DESIGNING the magnetic circuit of telephone equipment relays is as much of a science as electrical circuit designing, and as fully dependent on sound principles. For example, the magnetomotive force, reluctance (magnetic resistance), and magnetic flux (lines of force) acting on a magnetic circuit, are related to each other just as electromotive force, resistance and current in an electrical circuit are related to each other. Also, a law somewhat similar to Ohm's Law applies to a magnetic circuit, and is as follows: "The total flux in a magnetic circuit is directly proportional to the magnetomotive force acting in the circuit and inversely proportional to the reluctance of the circuit."

This is analogous to the expression for Ohm's Law, where: "The value of the current in an electrical circuit is directly proportional to the electromotive force, and inversely proportional to the resistance." However, precise mathematical calculations regarding a magnetic circuit are much more difficult than those of an electric circuit, due to an additional factor in the calculation being introduced by magnetic leakage; that is, some of the lines of force, set up by a relay winding, complete their path through air, instead of through the relay armature where they are needed, and therefore, are lost as far as useful work is concerned.

Magnetic lines of force, like electric currents, cannot exist without a return circuit. But unlike electric currents, magnetic lines of force can complete their circuit through any substance. For example, it is assumed that all lines of force in a relay magnetic circuit follow the desired path, but as previously stated, some of the lines instead of following the path through the relay iron frame, core and armature, will return through the air. The greater number of lines, of course, will follow the path through the iron as the reluctance of the iron is very much less than the reluctance of the air.

The circuit through air is in parallel with that through the iron, and the number of lines of force flowing through the air circuit will depend on the relative reluctance of the two circuits, in a manner similar to two electric circuits in parallel.

PART 45. The preceding article in this series appeared in the Dec. 8, 1951, issue, p. 37.

Because of various service conditions, telephone relays will generally be designed so that the amount of the air gap and non-magnetic material in the circuit through which the lines of force must pass is kept to a minimum. This is desirable since the shorter the air gap the greater will be the number of lines of force set up, and hence the greater the pull on the relay armature.

The magnetic circuit of a relay can be traced by referring to *Fig. 1*, which

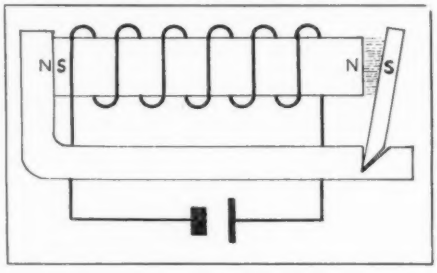

Fig. 1

represents a gravity type relay, so called because of the fact that gravity is relied upon for restoring the armature to its normal (unoperated) position.

When the circuit through the relay winding in *Fig. 1* is closed, the electric current which flows sets up a magnetic field through the iron core of sufficient strength to insure the prompt response of the armature to the closing of the circuit. If the electric current is in such a direction as to make the end of the core nearest the armature a north magnetic pole, then the magnetic lines of force go out of the core, across the air gap, into the armature, through the iron frame to the other end of the core and back to the starting point.

This produces the same effect as when the north pole of one magnet is put near the south pole of another. Thus, the end of the relay core in this case is considered as being a north pole, and the armature a south pole, and since unlike magnetic poles attract each other, the relay armature will be pulled up against the core.

If the current through the relay winding is reversed in direction, the armature will pull up as before, but the armature will now be a north pole and the end of the core next to the armature a south pole.

When the armature pulls up, the air gap is shortened and the reluctance of the magnetic circuit is decreased, thereby causing the lines of force to be increased. The reluctance of the air gap between the relay armature and core is always a large percentage of the total reluctance of the magnetic circuit.

Since the pull on the armature depends on the number of lines of force, the relay armature will be held with greater attraction than that which was originally exerted upon it to pull it up. If the lines of force are allowed to become too great, then the relay core might become saturated, which would cause certain relay armatures to be too slow in releasing or stick in the operated position.

This condition is prevented in several ways. For example: (1) Some relays have part of the magnetic circuit composed of a very small cross section, which increases the reluctance so that, even if the relay armature were allowed to come close against the core, the reluctance would be sufficient to prevent too great a magnetic flux. (2) The clearance between the armature and pole piece (core face) in some relays is reduced to the least distance compatible with satisfactory operation. (3) Other relays are equipped with stop pins of copper, or other non-magnetic material, which do not allow the armature to strike the core and stick. Still others have what are called non-freezing discs.

Relays used in the operation of a telephone system may have several windings. For the purpose of differentiation, these windings are classified as primary, secondary, tertiary, quaternary, quinary, etc. Where there are two or more windings on the same relay core, care is taken to insure that the magnetism produced by one winding acts properly on the magnetism produced by the others. One winding can be made to either add to or neu-

tralize the magnetism of the other, depending upon the direction of the electric current flow and the manner in which the turns of wire are wound upon the relay core. A detail to be noted relative to the winding of relays is that the exact number of ampere-turns for a given relay is carefully calculated, because each additional turn of wire adds its resistance to the circuit, and decreases the current flow.

Although it may seem that up to a certain point at which the relay core becomes "saturated," the magnetizing force produced would gain more by additional turns than it loses by the corresponding reduction in current flow, actually when the point of magnetic saturation is reached, adding turns does more harm than good, for the relay core, being already "soaked" with magnetism, receives no benefit from the added turns of wire.

(To be continued)

V V

Commerce Department Revises List of Essential Activities

A revised list of essential activities was issued on Jan. 16 by Secretary of Commerce Charles Sawyer, according to a recent member letter of the United States Independent Telephone Association. The revised list includes the continued listing of the following activities in connection with communications:

COMMUNICATION SERVICES: Telephone; telegraph; radio-telephone and radio-telegraph; cable service (land or submarine); protective signal systems.

* * * *

PRODUCTION OF COMMUNICATION EQUIPMENT: Military radios, radar, and related electronic equipment and component parts; central switchboard equipment; printing telegraph equipment; coaxial cable.

The list is one recommended by the Joint Department of Commerce-Department of Labor Committee on Essential Activities and Critical Occupations with the approval of an interagency advisory group composed of representatives from the Selective Service System and the Departments of Defense, Agriculture and Interior. It is for use by the Department of Defense in considering requests for delaying calls to active duty of reservists and the National Guard. It is also made available to local draft boards as information to assist them in making determinations on requests for deferment of registrants. Persons in activities appearing on the list will not necessarily be automatically granted deferments. Agencies using the list will do so in conjunction with a list of critical occupations.

TEMPERATURE CONSTANT TABLE
REDUCING OHMS TO FEET AND FEET TO OHMS
NO. 22 A.W.G. COPPER WIRE

DG. FH.	FEET PER OHM	OHMS PER FOOT	DG. FH.	FEET PER OHM	OHMS PER FOOT
110	56.38	0.01780	50	64.42	0.01540
109	56.52	0.01776	49	64.56	0.01536
108	56.65	0.01772	48	64.69	0.01532
107	56.79	0.01768	47	64.83	0.01528
106	56.92	0.01764	46	64.96	0.01524
105	57.06	0.01760	45	65.10	0.01520
104	57.19	0.01756	44	65.23	0.01516
103	57.33	0.01752	43	65.37	0.01512
102	57.46	0.01748	42	65.51	0.01508
101	57.60	0.01744	41	65.64	0.01504
100	57.73	0.01740	40	65.78	0.01500
99	57.87	0.01736	39	65.91	0.01496
98	58.01	0.01732	38	66.05	0.01492
97	58.14	0.01728	37	66.18	0.01488
96	58.28	0.01724	36	66.32	0.01484
95	58.41	0.01720	35	66.45	0.01480
94	58.55	0.01716	34	66.59	0.01476
93	58.68	0.01712	33	66.72	0.01472
92	58.82	0.01708	32	66.86	0.01468
91	58.94	0.01704	31	66.99	0.01464
90	59.08	0.01700	30	67.13	0.01460
89	59.21	0.01696	29	67.26	0.01456
88	59.35	0.01692	28	67.40	0.01452
87	59.48	0.01688	27	67.53	0.01448
86	59.62	0.01684	26	67.67	0.01444
85	59.75	0.01680	25	67.80	0.01440
84	59.89	0.01676	24	67.94	0.01436
83	60.02	0.01672	23	68.07	0.01432
82	60.16	0.01668	22	68.21	0.01428
81	60.29	0.01664	21	68.34	0.01424
80	60.43	0.01660	20	68.48	0.01420
79	60.56	0.01656	19	68.61	0.01416
78	60.70	0.01652	18	68.75	0.01412
77	60.83	0.01648	17	68.88	0.01408
76	60.97	0.01644	16	69.02	0.01404
75	61.10	0.01640	15	69.15	0.01400
74	61.24	0.01636	14	69.29	0.01396
73	61.37	0.01632	13	69.42	0.01392
72	61.51	0.01628	12	69.56	0.01388
71	61.64	0.01624	11	69.69	0.01384
70	61.78	0.01620	10	69.83	0.01380
69	61.91	0.01616	9	69.96	0.01376
68	62.05	0.01612	8	70.10	0.01372
67	62.19	0.01608	7	70.23	0.01368
66	62.32	0.01604	6	70.37	0.01364
65	62.46	0.01600	5	70.51	0.01360
64	62.59	0.01596	4	70.64	0.01356
63	62.73	0.01592	3	70.78	0.01352
62	62.86	0.01588	2	70.91	0.01348
61	63.00	0.01584	+1	71.05	0.01344
60	63.13	0.01580	0	71.18	0.01340
59	63.27	0.01576	—1	71.32	0.01336
58	63.40	0.01572	—2	71.45	0.01332
57	63.53	0.01568	—3	71.59	0.01328
56	63.66	0.01564	—4	71.72	0.01324
55	63.79	0.01560	—5	71.86	0.01320
54	63.92	0.01556	—6	71.99	0.01316
53	64.05	0.01552	—7	72.13	0.01312
52	64.15	0.01548	—8	72.26	0.01308
51	64.29	0.01544	—9	72.40	0.01304

Prepared by John A. Bracken

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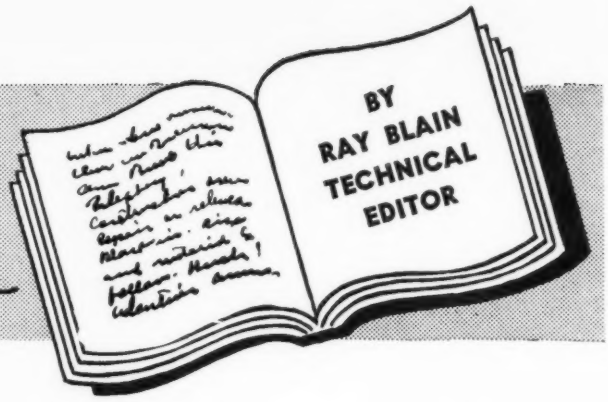
THE PLANT MAN'S *note book*



BY RAY BLAIN TECHNICAL EDITOR

IT IS surprising how many people, especially small business concerns, list two telephone numbers. Because of the large traffic volume, many have found that most people get discouraged when they call one number frequently and find it busy. While it is true that a person cannot answer more than one telephone at a time, if another number is available, someone else can answer it and advise the party desired and they can call back later.

• • •

Someone has said that economy is a way of spending money without getting any fun out of it.

• • •

It is noted that the Chesapeake & Potomac Telephone Co. in Maryland has a new type of rear bumper installed on some of their light installation trucks. This bumper is about 6 inches wide and has a dip of several inches in the center section.

Being a foot or more wide, this type of bumper should line up with the bumpers of almost any type of car on the roads today. Such an arrangement should prevent damage to radiators and grills of passenger cars in the event of minor accidents.

In addition, this new type of bumper is painted orange so that it presents a very good target to following motorists.

• • •

Approximately 3,369 engineering hours are required to build one modern swept-wing jet fighter. Its World War II predecessor took only 414 engineering hours.

• • •

A recently developed mechanical drafting pencil that uses flat, very thin drawing lead is now available. The lead used in this instrument measures approximately 0.018 inch thick by 0.097 inch wide and 4 inches long. Lead is offered in HB, F and H to 9H degrees. This pencil is especially usable for lofting work and all types of drafting and designing where straight line drawing is essential.

• • •

Just outside the coffee shop of the Conrad Hilton (formerly Stevens) Hotel in Chicago, there recently has been installed a five-stall booth to house an equal number of public coin telephones. These are the short open type of booth and are constructed of plywood without acoustical treatment of any kind.

While such an arrangement can be used to complete calls, it certainly is not in keeping with the usual furnishings of a first-class hotel.

• • •

We understand that a city ordinance in Portsmouth, N. H., requires all television antennas to be protected by an 8-foot ground rod. Actually, a large outside antenna of this type is similar to a lightning rod and should have protection by means of a suitable arrestor and ground connection.

• • •

One of the first Edison nickel-iron-alkaline storage batteries used in railway signal service has just been retired after 40 years of virtually continuous operation on the Southern Pacific Railroad in California.

• • •

Someone has said that a super salesman is one who can sell a double-breasted suit to a Phi Beta Kappa man.

• • •

Cinders of dust specks can be removed from the eyes with "Eyesweep," a device which has a magnet at one end to remove steel splinters and a loop at the other to pick out non-metal specks. This instrument can be sterilized.

• • •

Returning from a recent trip to Cedar Rapids, Iowa, by air, our big Capital Constellation made the trip from Chicago to Washington, D. C., in two hours and five minutes, representing a ground speed of over 320 miles per hour. That, we are sure you will agree, was really flying!

• • •

A new walkie-talkie, drive-in restaurant was opened recently in Philadelphia which is said to be the first of its type east of the Mississippi.

This restaurant features three girl carhops who take orders from customers parked in their autos and relay them direct to the kitchen by walkie-talkie radio telephones.

• • •

The writer got off a plane at La-Guardia Field in New York City recently and started looking for a public telephone. We began in the concourse and passed a total of 17 booths in use before eventually locating one vacant in the main station.

• • •

American industry is now using twice as much electrical energy as it used in the pre-war year of 1939.

• • •

Detroit is presently working on a special-order limousine for President Peron, of Argentina, that will have air-conditioning, television, a midget refrigerator and a telephone.

• • •

It is reported that 98 per cent of all American homes have radio; 47 per cent have two radios; 10 per cent three radios, and 5 per cent four radios. Nineteen million cars have radios; 5 million public places have radios.

• • •

Talking books for the blind consist of sets of special long playing records. Each disc has title and page number in braille. Printed books of average length require eighteen double-faced records.

PLANT MAN'S QUIZ

Q. Will it be possible to make use of Scotch electrical tapes in extremely low temperatures?

A. We are reliably informed that this tape will stand practically any extreme of weather after application, but needs some warming in very cold weather before using.

It is necessary, therefore, when making splices outdoors in extremely cold weather to keep the tape at warm weather pliability. This may be accomplished by carrying it in an inside jacket pocket by linemen so that it will absorb some of the body heat prior to its use.

• • •

Q. Is there available a power-driven earth auger that can be used to dig holes into which poles with extra large butts are to be set?

A. One type of earth auger is available in various sizes from 10 inches to 54 inches.

You did not mention the size of the butts of the poles you have to set, but, as a rule, a 36-inch auger will prove adequate to set the average pole used in telephone plant.

• • •

Q. When defective pairs are found in a new cable and not cleared, should they be terminated on the main frame?

A. In the first place, every effort should be made to make all pairs serviceable in new cables. However, if one or a few pairs are defective in a new cable and they are not immediately required—and the cost of clearing them may prove excessive—they may be left out of service for the present.

These pairs should be terminated on the main frame in the same manner as are the other working pairs. Repairs may then be effected at a later date if and when these facilities are urgently required.

• • •

Q. We are planning the conversion of a magneto exchange to dial operation in the near future and will appreciate any information you may be able to furnish us as to the changes and improvements which will be required in our outside plant prior to the cut-over. Also, will these changes prove overly expensive?

A. The improvements required and their costs will in all probability depend upon the present condition of your magneto plant. Usually when a magneto exchange is converted to dial operation, the principal improvements will consist of cable repairs, replacement of all defective drop wire, and elimination of high resistance joints and tree interference.

If your cable plant is in good condition, very few repairs will be necessary for dial operation. If, however, you have low insulation in your present cables, even though it may not cause serious trouble on the magneto system, it may interfere with the proper operation of the dial system. Failures of this nature are primarily due to the break-down effect that the high induction voltage surges, inherent in dial systems, have on low insulation resistance of cable conductors. If there is any question as to whether the cable insulation is adequate for dial operation, a check of the pairs with a proper testing instrument should be made prior to the actual conversion to dial. Any low insulation detected should be cleared promptly, as it may lead to eventual failure and service interruption.

When drop wire plant ages, the insulation often "checks" and, because of the proximity of the two wires of the pair, an electrical path is provided between the two conductors in wet weather. This leakage may only slightly impair transmission in a magneto system, but may seriously interfere with dialing after conversion to full automatic operation. It may also cause premature ring cut-offs. The drop wire plant should be "spot checked" and all low insulation drops found removed prior to conversion. A drop is no better than its wet weather insulation, if a good grade of continuous service is to be furnished.

Prior to conversion, an inspection should be made of the condition of trees throughout the exchange. Bare open wire lines which contact trees will lower the insulation resistance to ground to the extent that proper dial operation may be affected. Therefore, trees should be trimmed or other corrective action taken, such as replacing bare wire with insulated tree wire.

In some cases, it may be possible or necessary to replace open wire with cable or reroute the lead so as to clear all tree interference. A careful check should also be made of all open wire leads, and all defective insulators should be replaced.

It is our suggestion that you not have serious concern as to the expense of plant reconditioning necessary for dial conversion. This is based on the assumption that, if the outside plant has deteriorated seriously, it will eventually cause trouble and service interruptions on the magneto system. In this event, the repairs would surely be required even though the dial conversion be not carried out.

• • •

Q. Prior to the cut-over of a new exchange, where half-taps of the outside cables are involved, should it be necessary to test all telephones into the new exchange?

A. Adequate tests should be made to determine if all cable throws and half-taps are properly made and whether uninterrupted service will be possible when the throw is made over to the new exchange. If the testing of each line into the new exchange is necessary to insure proper operation, then make this test by all means. However, a spot check will usually provide proper assurance if the cut-over has been properly planned.

V V

"Commissioner of Internal Revenue Dunlap says that if there is not some let-up in criticism of his bureau, people are going to lose confidence in it. Six out of 64 collectors of internal revenue have resigned under fire and two of them have been indicted for taking bribes. In addition, numerous lesser officials charged with duties in connection with collecting federal taxes have been caught redhanded taking bribes and practicing favoritism toward taxpayers. . . . If that causes people to lose confidence in the outfit, let them make room for officials who can be trusted and who will not yield to temptations to take bribes and feather their own nests at the expense of the taxpayers."—Fort Payne (Ala.) *Times-News Era.*

V V

"Announced determination of leaders in industry, labor, farm groups and others to put a 'stop' sign on the ascending spiral of prices, and a declaration of war against government waste, indiscriminate needless expenditures, and blue-sky operation of armed force procurement officers would, in our judgment, do more to end the threat of war and bolster the security of our people than any single step that could be taken. Furthermore, we believe it would at once affect our economy so that a worker's dollar would regain much of its value as a medium of exchange."—Apollo (Pa.) *News-Record.*

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THE OPERATOR'S Corner

BY
MAYME WORKMAN
TRAFFIC
EDITOR

"YOU should see our new toll board. It is really marvelous. The calls go through so fast, it is almost like magic!" Thus wrote a young lady who had frequently stated she was not interested in learning to operate the toll board. She was an excellent local operator and satisfied to continue in this phase of the work.

Then came the dial conversion which posed the problem for the young lady of learning to handle long distance calls or seeking employment elsewhere. Like all operators who have been engaged in telephone work for a number of years, she was loathe to resign, so decided to learn to operate the new toll board, a decision that turned out to be much to her satisfaction.

In central offices having a separate toll board, local operators often prefer to continue handling local calls rather than learn to operate the toll board. Such operators fail to realize they cannot be classified as experienced operators unless they are familiar with the operation of all central office equipment and the handling of all types of calls. Of course, this does not apply to metropolitan areas where operators handle one type of call exclusively, such as CLR, Inward or Through. It is applicable to the so-called medium-sized exchange handling local, rural, long distance, and various other calls in the same central office.

An efficient local operator frequently believes mistakenly that she will not be able to learn to handle long distance calls as effectively as she does local calls. The very fact that she is a good local operator indicates she is interested in her work and has a sincere desire to do a good job. This attitude will be helpful in her development as an efficient toll operator.

There have been instances where an operator was unable to qualify for supervisory work because she failed to take advantage of the opportunity to learn toll. A supervisor must be familiar with the handling of all types of calls in order to teach and coach operators.

Everything we learn can be put to good use at some time or another, whether it be handling long distance calls or baking a cake. The more we learn, the more we get out of life and the better we are equipped to take our place in this great universe. To be conscious of the necessity of knowing more is a big step toward knowledge, but did you ever notice that the *interest* in knowing more comes first?

In every central office you will find operators who are eager to learn. If they are seated adjacent to a position they have not learned to operate, they are observant and, when the opportunity presents itself, they will ask their supervisor, "When can I learn to operate the rural board?" or, "When will I be in line for toll training?" We also find the operator who is *not* interested in learning the operation of other positions. She is perfectly willing to plod along in the same manner, day after day. She is lacking in ambition, interest and enthusiasm. Fortunately, this type of operator is in the minority. The majority of operators are eager to learn new things and to progress in their work.

Knowledge is useful only as it is employed. It is not enough that the mind be a storehouse. It should be a workshop as well. If you are interested in becoming a successful operator, talk to your supervisor or chief operator. They were operators, too, in the beginning, and know what it takes to progress. Your supervisor may tell you the happiest days she spent in the central office were the days when she operated the switchboard, but, being ambitious and having a feeling of pride, she was not content to remain an operator indefinitely. Progress brings added responsibility, but it brings satisfaction. too.

"She's the life of the party line."

Hard work is the basis for success in any line of endeavor; promotions are won by hard work. On every scroll of success, on each column of achievement, on all trophies of triumph, every history, biography, record of real results, you will find all cost study, preparation and the hardest kind of hard work.

Work should never be regarded as something unpleasant. We know there is no happiness in idleness, no accomplishment in loafing, but there is a big and lasting satisfaction in doing any job and in doing it well. Work brings to us the great blessings of health, happiness and what we desire.

Take a dozen successful people of your acquaintance and inquire of the secret of their success, and you will find that their so-called genius is nothing more, nothing less, than application, hard work, special knowledge, and more hard work.

It is not so much the kind of work you are doing, but the kind of thinking you are doing that will differentiate you and promote you.

Traffic Questions

(1) On a long distance call, if the called number was not supplied by the calling party, should the number be given to him when it is secured?

(2) When should you start timing a station call: When switchhook supervision is received from only one station, or no supervision?

(3) What timing allowance would apply on the following call: Switchhook supervision is not received from either the called or calling telephone on the first route and on which a 15-second timing allowance applies; the call is completed over an alternate dial route on which switchhook supervision is received from the called telephone?

(4) Is it necessary to learn toll to be a successful operator?

(5) On a call from a public telephone, in making a subsequent attempt, should you reach the calling telephone and find out if the calling party is there before making an attempt on his call?

Answers are presented on page 37.

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Miscellaneous Accounts Receivable Ledgers
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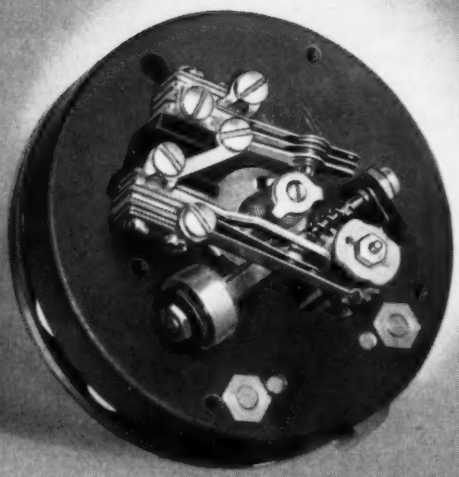

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Courts and Commissions

SW Bell Increase in Kansas To Provide 6.35% Return

Southwestern Bell Telephone Co. was authorized on Jan. 23 by Kansas Corporation Commission to increase telephone rates of its 344,000 customers in Kansas. The increase approved by the commission will amount to $4,725,000 a year.

The commission's action was on a company application which requested an annual increase of $5,940,000.

The increase approved brought the total of increases granted to the company in Kansas since January, 1949, to $11,388,977. The action also made permanent a temporary increase of $3,350,000 a year granted by the commission in June, 1950.

No exact breakdown of the increased rates will be available until the company files new rate schedules for the approval of the state commission.

Company statisticians figured that the rate increase will amount to about one dollar a month per customer.

The increase authorized by the commission was based on a finding that the value of Southwestern Bell property in Kansas is $68,537,000. The new rates, according to Jeff A. Robertson, commission chairman, will provide the company a return of 6.35 per cent on its Kansas investment, compared with a return of 8 per cent which had been sought by the company.

V V

State Supreme Court Upholds N. Y. Bell Company-Wide Raise

The Appelate division of New York State Supreme Court on Jan. 9, in the case of City of New York v. Feinberg *et al*, upheld the New York Public Service Commission's order (May 12, 1950) granting New York Telephone Co. rate increases.

New York City opposed the granting of the rate increases by the New York commission on a company-wide basis, instead of on an exchange basis. New York City contended that the company-wide method of rate-making is unlawful in that it violates the provisions of the state public service law; that it works a preference in favor of the company's subscribers outside of New York City and subjects that "locality" to unjust prejudice and disadvantage.

New York City pointed to the record showing that the need for increased earnings was due to the small net earnings in the smaller exchanges, whereas the earnings in New York City were in line with the "allowable standard." The city urged that this in effect results in unlawfully using the revenues there earned to subsidize the company's less profitable operations in the rest of the state, where the new rate increases are less and telephone service is rendered at lower rates.

The commission's main answer to this contention is that, when all is said and done, the proof establishes that the rate-making method which has been employed simply works out to insure *equal rates for equal service* which the company renders throughout the entire area of the state.

"It appears that many years ago, as telephone service expanded and improved, the 'state-wide method' in telephone service rate-making was adopted in place of the 'local area method' which at one time was in use. That just and reasonable rates are best arrived at by treating the property, revenues and expenses of the company on a unitary basis is amply supported by evidence," the court said.

The court continued:

"The particular question raised is whether the determination of the commission arrived at by use of method employed violates the provisions of the statute aforesaid. In ordaining just and reasonable charges, the statute forbids that they be unequal for 'like and contemporary service . . . under the same or substantially the same circumstances and conditions.' (Public Service Law, sec. 91, subd. 2). It is when such charges are unequal that other consequences follow which are forbidden by said statute. The record discloses that throughout the area of its various exchanges there is a marked dissimilarity of the circumstances and conditions under which the company renders its services and also in the extent and reasonably considered assessment of the services. The new rates are equal within the exchanges where like service is rendered under like circumstances. Only the uniform employment of permissible factors causes their variance in other respects. We see no violation of the statute in the determination under review."

V V

Sues SW Bell for $95,000 In Shock Suit in Arkansas

Southwestern Bell Telephone Co. was named defendant in a $95,000 damage suit filed on Jan. 24 in Pulaski Circuit Court, Ark., by a Cammack Village woman who charged she suffered serious injuries from an electrical shock as she picked up her telephone recently.

Brought by Mrs. Fred C. Berg Jr., the complaint said the shock occurred on Dec. 3, when the defendant company was attempting to locate interference on a telephone line between Mrs. Berg's residence extension and a store operated by Mrs. Berg and her husband three blocks distant.

The suit alleged that Southwestern Bell "in endeavoring to locate interference which had been reported, did negligently and carelessly place large quantities of voltage, current or power on said telephone line, without disconnecting said extension, and thereby caused plaintiff to receive a severe shock when plaintiff picked up the residence phone and placed it to her ear."

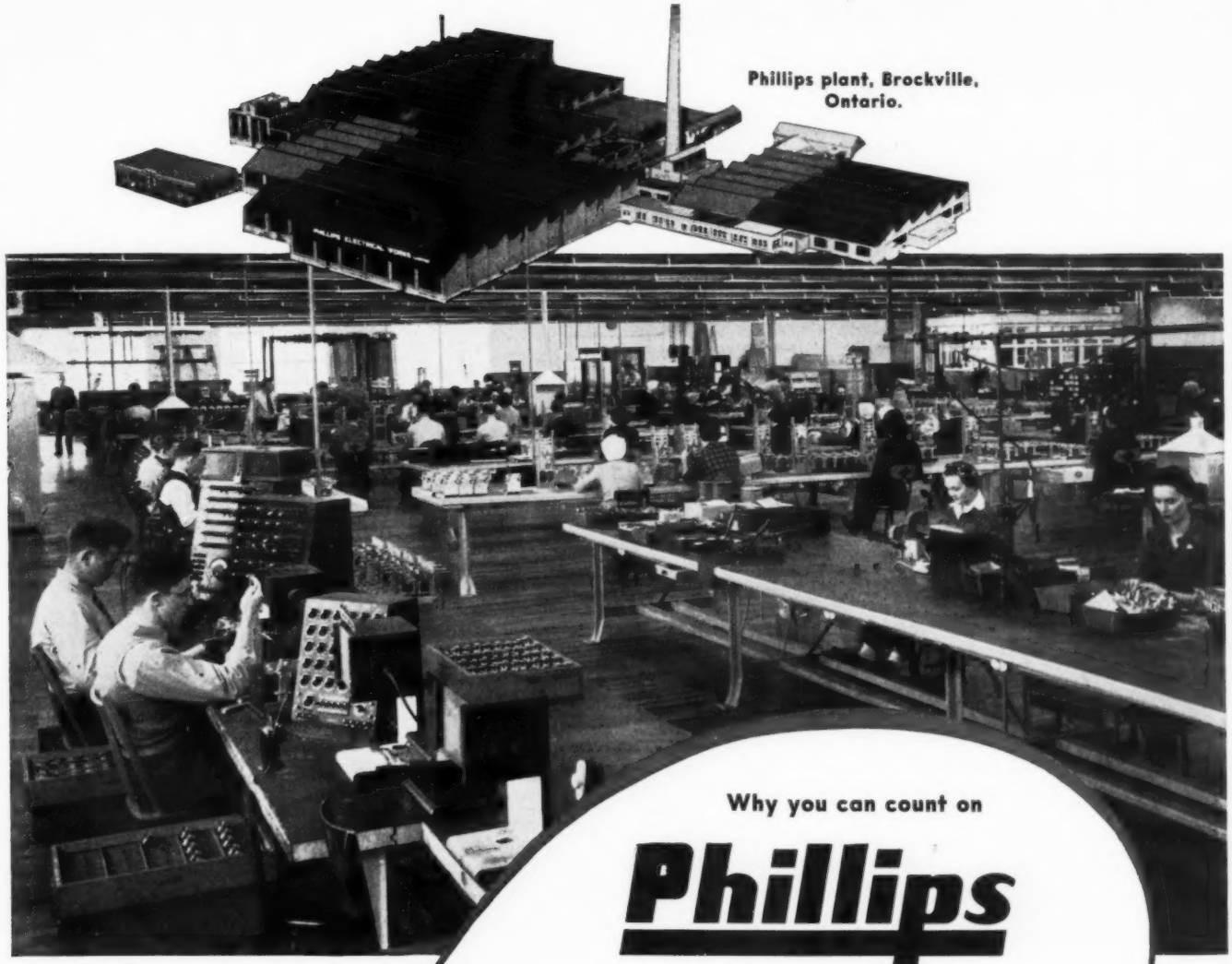
V V

Rate Increases Authorized for Two Minnesota Companies

Minnesota Railroad & Warehouse Commission on Jan. 21 approved rate increases for two Independents, Lake Park Telephone Co. and Park Region Mutual Telephone Co., Dalton.

In granting the Lake Park company increases, the commission estimated new operating revenues would be $12,253 and net income $2,071. On the rate base of $35,300 this is a 5.86 per cent return. However, the commission observed:

"Upon the hearing, applicant failed to present evidence in support of the rates applied for, due principally to improper accounting. It appears that all labor, material and other items relating to the operation of its telephone system are charged to operating expenses, resulting in an inflated operating cost; therefore the rates applied



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for have been adjusted to more nearly reflect the revenue requirements under the prescribed accounting procedure. Applicant cannot expect its subscribers to supply the funds required to replace units of property or for new construction and addition to its property."

New and old rates are:

	Old Gross Rates	*New Gross Rates*
One-party business	$2.75	$3.25
Two-party business	2.50	2.75
One-party residence	2.00	2.25
Two-party residence	1.75	2.00
Four-party residence	1.50	1.75
Rural multi-party—company owned	1.75	2.00

A discount of 25 cents to be allowed on all rates if paid in advance.

The Lake Park company serves 181 local and 282 rural stations.

Park Region company raises were for its Underwood and Dalton exchanges, and most of the new rates were to be effective after conversion of the two exchanges to dial. The commission noted that the company had applied to REA for a loan of $159,000; also that "as soon as funds are available it plans to convert its entire system to dial operation." Upon conversion the original cost of plant and equipment would be $174,504. With operating revenues approaching $29,535, and net income $6,427, the expected return would be 3.68 per sent.

Approved dial rates are:

One-party business	$4.75
Two-party business	4.25
Rural multi-party business	4.00
One-party residence	3.50
Four-party residence	3.00
Rural multi-party residence	3.50

All rates to be billed quarterly in advance and a discount of 75 cents is to be allowed if paid in the first month of the quarter in which service is rendered; 50 cents if paid in the second month of the quarter; and 25 cents if paid in the third month of the quarter.

Park Region Mutual serves 151 local and 498 rural stations from exchanges in Underwood and Dalton.

V V

Report Sale of Two Oklahoma Independents

B. Richardson, telephone engineer of the Oklahoma Corporation Commission reports that A. L. Irwin purchased the Foss Telephone Co. and has taken charge of the property.

He also reports that Merle Putty purchased the Chouteau Telephone Co., with about 137 telephones, and took charge on Dec. 27. The exchange was purchased from Mrs. M. Davis. The new owner intends to put in an exchange at Mazie and extend lines about six miles south from Chouteau to that town.

Peninsular (Fla.) Company Asks Commission for 8% Return

Peninsular Telephone Co., Tampa, Fla., will seek permission to raise its rates at a hearing on Feb. 12.

Florida Railroad & Public Utilities Commission ordered the company to publish its proposed rate increases in every town where it has an exchange.

Peninsular contended in its application that it needs an 8 per cent return on its investment.

The company made an unsuccessful bid last year for a rate increase of about 27 per cent. The commission turned down the request because it ruled earnings of 7 per cent gave the company a fair return.

The company's application before the commission does not show the amount of additional revenue it wants nor the percentage of increase proposed. It states, however, that an 8 per cent return on its investment is needed.

V V

Illinois Court Denies Move To Dismiss Rate Case

Judge Charles A. O'Connor of Kane County (Ill.) Circuit Court on Jan. 21 denied Illinois Commerce Commission's motion to dismiss Illinois Bell Telephone Co.'s appeal of the commission's recent decision denying the company a $22,800,000 annual rate increase. Judge O'Connor will set a date for hearing the appeal (TELEPHONY, Dec. 22, p. 28).

Attorneys for the state regulatory body had contended that the Kane County court did not have jurisdiction either over the company's appeal or its temporary injunction suit. The latter would restrain the commission from interfering with the company in putting increases into effect.

The court upheld the argument of Douglas F. Smith, Illinois Bell attorney, who contended that company property was being confiscated, and that Illinois Bell had the right to seek relief in any court in territory served by the company.

V V

FCC Dismisses AT&T Radio-Telephone Request

The Federal Communications Commission (FCC) on Jan. 10 dismissed an application of the American Telephone & Telegraph Co. for construction permits to establish a rural subscriber radio-telephone private line system in Alabama and Mississippi for the exclusive use of the Gulf Refining Co. The commission based its action on the opinion that furnishing of a private radio communications system of the type contemplated in the applications does not come within the scope of rural subscriber service according to present rules and policy. However, the commission further stated that provision of this type of service will be considered when rules for the rural subscriber service are promulgated.

On Jan. 17, the FCC denied a further request of AT&T filed on Jan. 14 for special temporary authority to construct and operate for a period of 90 days 11 very high frequency (VHF) radio stations in the states of Alabama and Mississippi to establish this radio network. The commission stated that no additional facts warranting a grant were disclosed in the request. The action on the second request was taken by the commission *en banc*, Commissioner Walker dissenting. In denying the request, the commission again, as on Jan. 10, informed AT&T that it would be afforded an opportunity for a hearing with respect to this matter if it so desired and that any request for a hearing should be filed within 20 days.

There are indications that the commission will give consideration in the near future to the promulgation of rules governing rural subscriber radio-telephone service. At the present time general mobile service frequencies in the band 152-162 megacycles "are available for assignment to the rural subscriber and short-haul toll telephone service on a geographical or frequency separation basis, provided that no interference is caused to the land mobile service."

V V

NW Bell Increase in Nebraska Only 54% of Amount Requested

Northwestern Bell Telephone Co. has been advised by Nebraska Railway Commission that it will permit increased rates to provide additional net earnings of $556,646 a year, and has directed the company to submit for approval schedules for each of its 100 exchanges so set up to produce the additional revenues.

The company had asked for approval of an application that would add $1,036,672 to net earnings. The commission figure is $480,876 less and represents but 54 per cent of the amount the company asserted as necessary and justifiable. To support its claim, the company had submitted 122 exhibits and testimony that comprised 1,296 pages in the record.

Richard H. Larson, chairman of the commission, said that after a careful study by its members and its staff, the decision was reached that the figure fixed was just and reasonable since it would produce a return of 5.66 per cent on the cost of the property in use, less depreciation. Larson said that this

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percentage of return is substantially less than the 6.5 per cent return provided in the last order of the commission affecting Northwestern Bell rates entered in June, 1949, the last time a raise was granted. He added that the final order will recognize that higher rates than those now in force are justified because of increased taxes, wages and materials. The company had sought a return of 7.13 per cent on its investment.

Strong protests from company officials followed shortly after the announcement. L. O. Arstad, general manager, said he could not understand why the company was awarded only half of what it asked for.

"Such action," he said, "if sustained, will unquestionably impair our ability to handle the growing communication needs in Nebraska. What further action the company will take cannot be determined until later and after we have studied the report."

A member of the commission staff said that, if the commission order stands, the company will have a net income of $1,853,000 and a gross of $15,700,000 yearly.

The Nebraska law provides for an appeal to the courts from the commission in all rate cases, but that there must first be filed and denied a motion for rehearing before the rate-making body. The Nebraska Supreme Court is committed to the doctrine that orders and findings of the commission will not be disturbed unless they are found to be arbitrary and unreasonable.

V V

Harrisonburg (Va.) Company Asks 'Reasonable' Increase

Virginia Corporation Commission announced that Harrisonburg Telephone Co.'s request for higher rates will be the subject of a public hearing on Feb. 18.

Although no new rates have been proposed, the company has complained that its present revenues are unreasonably low and has asked the commission to allow reasonable adjustments.

V V

Iowa Company First in State To Join National Toll Dialing

Farmers Mutual Telephone Co., Clarinda, Iowa, late in January became the first Independent telephone company in that state to introduce operator dialing of long distance calls.

The first use of the new toll line dialing system was a connection to Council Bluffs, Iowa, on Jan. 27, according to A. L. Kelley, manager of the Clarinda exchange. This enabled the Clarinda operators to dial any of the Council Bluffs numbers without the assistance of another operator.

On Feb. 17, through connection with the new system at Omaha, Neb., Clarinda will join the nationwide toll dialing network. Through the Omaha system, Clarinda operators will be able to dial telephones in principal cities throughout the nation, as well as many other communities reached through them.

Clarinda will also have direct toll dialing connection with St. Joseph, Mo., and after the conversion of the Red Oak exchange to dial service late in the summer, Clarinda will have direct toll dialing connections with Red Oak, Iowa.

Establishment of the new service in Clarinda required equipping the toll board with dials and the installation of a considerable amount of other central office equipment, involving expenditures of about $5,000.

In anticipation of the introduction of toll line dialing, the Clarinda company for some months has been engaged in a public information campaign to encourage the placing of long distance calls by number. Emphasis has been placed on the greater speed of completion of calls when the number is given.

Clarinda is on the route of the Bell System's Omaha-Kansas City coaxial cable, which contains many of the toll dialing circuits. It joins the rapidly expanding network of cities which now have operator dialing of toll calls.

V V

Interstate Telephone Company Extends Dial Service

The 38th exchange of Interstate Telephone Co., Spokane, Wash., was converted to dial operation on Jan. 15, when Waterville was cut over.

Manson, Wash., near Chelan, with 200 subscribers was also converted to dial recently. The company has several more exchanges which will be cut over soon, at Harrison, Idaho and at Oakesdale, Wash. The latter exchange was purchased from Rosalia Telephone Co. in 1951.

Over 50 per cent of the company's 47,500 telephones are now dial.

Two Norway Engineers Visit Upstate Corp. of New York

As part of a project sponsored by ECA (Economic Cooperation Administration) of the United States government, Leif Ellef Saanum and Lorentz Angell Joys, engineers of the Norwegian Telegraph Administration, recently inspected the central office equipment and outside plant facilities of Upstate Telephone Corp. of New York in Johnstown, Gloversville and adjacent areas.

Saanum and Joys also have visited manufacturers of telephone equipment and are making a study of operating company methods and equipment.

The visit to the Upstate corporation was arranged through the Federal Communications Commission as an opportunity for the Norwegian engineers to inspect the step-by-step central office dial equipment in Gloversville and Johnstown and the associated operator intertoll facilities, together with cable construction and aerial wire lines. Saanum inspected cable and aerial line construction and the use of construction tools and equipment. Joys visited central offices and inspected the step-by-step dial equipment.

The visitors were conducted during their inspection tour by company personnel.

Officials of Upstate Telephone Corp. and Norwegian visitors. Left to Right: F. M. VAN NAMEE, plant maintenance supervisor; L. B. BLETHEN, chief plant engineer; ROY MESERVE, wire chief; LEIF SAANUM; L. H. MEYER, president; LORENTZ ANGELL JOYS; S. R. SWANSON, general plant superintendent; W. C. SPONENBERG, district plant superintendent; G. E. SLUSHER, vice president and traffic superintendent.

Make "Short-Haul" a Profit Toll in Your System!

THE time has come when any automatic telephone company can consider the short-haul toll problem without shuddering. North's new AuTollizer provides a method of converting this headache into a "helpmate" by taking low rate calls *away* from the regular toll board and placing them under fully automatic supervision.

First: the initial cost of this new toll-ticketing method is less than anything previously offered. Furthermore: with the AuTollizer system, made exclusively by North, the overall cost of supervision, recording and billing short-haul toll traffic, for the first time in telephone history works out to show a profit in the revenue from such calls.

The AuTollizer eliminates the need for expensive toll-ticketing storage circuits and translators. It employs, instead, low-cost tape-punching recorders (one per toll trunk) actuated directly from dial pulses, and a new inexpensive analyzer that combines tape "reading", translating, cost computing and printing, all in one unit. Result is a new and greatly simplified system that can be "proved in" quickly in any automatic exchange.

It cuts overhead on low-rate tolls
Does complete ticketing without supervision
Delivers computed toll tickets . . . or . . .
Operates automatic card-punching machines
Releases toll board space for higher rated calls
Fits large or small exchange operation

Dial-pulse-actuated tape recorder

Portable analyzer "reads", translates, prints ticket

NORTH'S AuTollizer

SAVES BY SIMPLIFYING!

THE NORTH ELECTRIC MANUFACTURING COMPANY

Originators of ***ALL RELAY*** *Systems of Automatic Switching*

1430 South Market Street, Galion, Ohio, U.S.A.

XUM

Commission Concludes Rehearing On Michigan Bell Rate Case

Michigan Public Service Commission has under advisement the renewed application of Michigan Bell Telephone Co. for a rate increase (TELEPHONY, Jan. 5, p. 28).

Testimony was concluded on Jan. 18 in a rehearing on the company's application originally denied in its entirety. The company sought a revenue increase of $17,700,000.

At the concluding session, Robert J. Demorest, commission staff accountant, testified that the company had an intrastate rate return of 5.9 per cent for 12 months ending Nov. 30, 1951, with the new 52 per cent federal tax rate applied to full-year operations.

One of the 10 errors claimed by the company in the order denying the original application was the failure of the commission to take the increased tax rate into account.

V V

SW Associated Granted Raise At Laverne, Oklahoma

Oklahoma Corporation Commission on Jan. 21, approved rates for Southwestern Associated Telephone Co., Dallas, Tex., at its Laverne, Okla., dial exchange, following the recommendations of Paul Reed, public utilities commissioner, who heard the case.

The new rates, to become effective immediately, are:

One-party business	$5.50
Two-party business	4.50
One-party residence	3.50
Two-party residence	3.25
Rural business (grounded)	3.00
Rural residence (grounded)	2.50
Rural business (metallic)	4.00
Rural residence (metallic)	2.75
Switched	.75
Switched, where company furnishes dial instrument, same rate plus 50 cents per month additional until instrument is paid for.	

V V

Pierce (Neb.) Company Seeks Increases After Conversion

Pierce (Neb.) Telephone Co. has applied to Nebraska Railway Commission for authority to increase rates, following conversion of the plant from magneto to common battery and otherwise improving service.

The company asked for a schedule that would increase individual residence rates from $2.50 a month to $4.00; party residence from $1.50 to $3.25; individual business from $4.00 to $6.00; party business from $2.70 to $5.25; rural service (company-owned), from 2.00 to $3.00, and rural switching from $7.20 a year to $12.00. A rate of $1.50 is asked for business extensions; $4.50 for new installations, and $2.00 for moving telephone.

1952 CONVENTIONS

Minnesota Telephone Association, Hotel St. Paul, St. Paul, Feb. 5, 6 and 7.

Louisiana Telephone Association, Francis Hotel, Monroe, Feb. 22 and 23.

Kentucky Independent Telephone Association, Phoenix Hotel, Lexington, Mar. 4.

Texas Telephone Association, Gunter Hotel, San Antonio, Mar. 10, 11 and 12.

Nebraska Telephone Association, Paxton Hotel, Omaha, Mar. 25 and 26.

Iowa Independent Telephone Association, Fort Des Moines Hotel, Des Moines, Apr. 8 and 9.

Illinois Telephone Association, Hotel Abraham Lincoln, Springfield, Apr. 17 and 18.

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, Apr. 21, 22 and 23.

Pennsylvania Independent Telephone Association, Bedford Springs Hotel, Bedford, Apr. 28, 29 and 30.

United States Independent Telephone Association Executives Conference, Broadmoor Hotel, Colorado Springs, Colo., May 8 and 9.

Wisconsin State Telephone Association, Park Hotel, Madison, May 14 and 15.

New York State Telephone Association, Mark Twain Hotel, Elmira, May 21 and 22.

Indiana Telephone Association, Claypool Hotel, Indianapolis, June 4 and 5.

California Independent Telephone Association, Biltmore Hotel, Los Angeles, June 19 and 20.

Michigan Independent Telephone Association, Olds Hotel, Lansing, Sept. 12.

Tennessee Telephone Association, Hotel Hermitage, Nashville, Sept. 17 and 18.

United States Independent Telephone Association (annual convention), Conrad Hilton Hotel (formerly the Stevens), Chicago, Oct. 13, 14 and 15.

North Carolina Independent Telephone Association, Carolina Hotel, Pinehurst, Oct. 23 and 24.

South Carolina Independent Telephone Association, Clemson House, Clemson, Oct. 30 and 31.

Virginia Independent Telephone Association, Roanoke Hotel, Roanoke, Nov. 6 and 7.

Alabama-Mississippi Independent Telephone Association, Jefferson Davis Hotel, Montgomery, Ala., Nov. 10 and 11.

Also sought is validation of a stock issue of $60,800, the proceeds of which financed the modernization of the properties, recently acquired by the Daubendiek interests.

V V

Arkansas Company Authorized To Issue $15,000 Common Stock

Arkansas Public Service Commission on Jan. 24 authorized Wilmot-Parkdale Telephone Co. to issue common stock with a total value of $15,000 par value.

The company recently was changed from a partnership between Robert C. Akers and Fay Akers of Wilmot into a corporation.

V V

Minnesota Commission OK's Sale

Sale of the Fleming (Minn.) Telephone Co.'s Fleming and Kimberly exchanges, which comprise all of the company's telephone properties, to McGregor (Minn.) Telephone Co. was approved on Jan. 16 by Minnesota Railroad & Warehouse Commission.

Nebraska Commission OK's Increase and Loan

Permission for a rate increase and for a loan was granted recently by Nebraska Railway Commission to two Independents.

Upland Telephone Co. was granted authority to raise its rates $1.00 per month on all classes of service.

Hamilton County Telephone Co., Aurora, obtained authority to borrow $40,000 for refinancing purposes.

V V

Monitor (Ore.) REA Loan OK'd

Approval of a Rural Electrification Administration loan of $72,000 to Monitor (Ore.) Cooperative Telephone Co. was granted on Jan. 22 by Oregon Public Utilities Commissioner Charles H. Heltzel. The mortgage note issued to the United States of America by the Monitor co-op will bear interest at the rate of 2 per cent, and payments are to be sufficient to discharge principal and interest within 35 years of the issue date.

XUM

Snow, sleet, wind, flood, fire — *each* is a crippler of service and may well prove to be a full-scale emergency.

That's why — when lines go down — telephone companies throughout the nation call on Graybar *first*. From experience, they've discovered Graybar's stand-out facilities for delivering emergency replacement items *fast* —wherever and whenever they're needed.

A nation-wide network of Graybar offices and warehouses provides ready accessibility to stocks of essential telephone supplies.

Through emergencies of all kinds, experienced Graybar personnel have developed the know-how needed to initiate immediate action and efficient follow-through.

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The next time you need emergency help, make it a point to call your near-by Graybar office. You're sure to get efficient, helpful service — the kind of service that's invaluable in emergencies . . . expected in everyday operations. 221-232

GRAYBAR ELECTRIC CO., INC.
Executive Offices:
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Call Graybar first for...

IN OVER 100 PRINCIPAL CITIES

XUM

In the Nation's Capital

(Concluded from page 14)

Leaving aside the bare test of confiscation under the Federal Constitution (which is all the Supreme Court was passing on, in reviewing the rates fixed in the Hope Natural Gas Case), the logic of using cost-of-capital as a sole or basic measure of a utility's return, is at least open to economic question. The cost-of-capital, after all, is only the judgment of the money market. It is the reflection of what a composite group of investors is willing to take, in return for the use of their money either as a debt obligation (bonds) or as capital investment (stocks).

The relationship of earnings to capital *already invested* does not enter into this picture. It is the investor already on the books, who is going to be affected by the rates fixed, far more than the people downtown in the financial districts who make a business of quoting bids and offers on various utilities. Their opinions may be swayed up or down by the money market factors which have nothing to do with the telephone company or its property investment, as such, or its operations.

Swedish Co-op Floats a Bond Issue

Is there a long-range tendency in the cooperative movement to return to capitalistic financing? Such was the question raised in the wake of the announcement last week that Sweden's Ko-operative Foerbundet, which does from 15 per cent to 20 per cent of the Swedish nation's retail business, was floating a $19,500,000 bond issue, maturing in 1972. While the principal attention in financial quarters was devoted to a novel "built-in" feature (adjusting the redemption at maturity to changes in monetary purchasing power), such independent financing by a cooperative was also noteworthy. It will be recalled that in Sweden, cooperatives do not enjoy tax exemption as in the United States.

In other words, here is a cooperative issuing bonds to be sold to outside nonmembers. Doubtless some of these bonds will be bought by American investors. New York banks are said to be quite interested. And if the cooperative needs to raise more money, it might even issue preferred stock. But when all this is said and done, what makes such a cooperative very much different from a regular corporation? When the cooperative movement began in England with the Rochdale experiments, over a century ago, it was thought to be a new and self-sufficient form of enterprise. The American columnist, Marquis Childs, wrote a rhapsodic book entitled "The Middle Way," viewing the Scandinavian cooperative movement as almost a panacea for all economic problems.

It looks now, however, as if the Swedish cooperatives will have to come back into the money market the same as a regular stock corporation to get the money it needs to build or expand. Such co-ops also seem to require added advantages, such as the escalator cost-of-living clause, to get investors to buy such a new type of securities. Is this what happens to the cooperative movement when the hand of government support is withdrawn?

The fact that this Swedish well-established cooperative can no longer look to its own membership for financial resources, to carry on its business functions, may be regarded as an admission that cooperatives, operating without subsidy, *do not tend to become economically self-sufficient.* If the cooperative member benefits must yield priority (in sharing the cooperative's earnings) to government taxes, as well as payments, interest or dividends on outstanding securities, then the cooperative tends to evolve closer towards a conventional corporation. There remains only a theoretical advantage in membership. Already, we see a trend in the United States away from tax exemption for co-ops. True, President Truman did ask Congress last week to relax the mild income tax imposed on co-op earnings last year. But the trend is still there.

V V

Dr. Ralph Bown to Head Research for Bell Laboratories

Dr. Ralph Bown, director of research for Bell Telephone Laboratories since 1946 and a member of the Bell System for more than 30 years, was appointed vice president in charge of research, effective Jan. 2., according to Dr. M. J. Kelly, president of the laboratories.

Other organization changes at the laboratories include the appointment of Dr. J. B. Fisk as director of research in physical sciences; Dr. H. T. Friis, appointed director of research in high frequency and electronics; Dr. W. H. Doherty, appointed director of research in electrical communications, and Dr. R. M. Burns, appointed chemical coordinator in addition to his duties as director of chemical and metallurgical research.

V V

» Approximately one and one-half million toll calls are placed by servicemen each month from public telephones at large military establishments in this country.

Construction Ma
With the Double
and America's Gu Le

The Churchill No. 100 Folding Door Telephone Booth

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telephone booth

. . . reduces overhead by increasing revenue

Users appreciate the comfort and quiet privacy afforded by the Churchill No. 100 Folding Door Telephone Booth. Operating companies enjoy increased pay station business.

Constructed as a single unit and equipped with a reinforced back panel for mounting a wall telephone or coin collector. Included as standard equipment are electric light and automatic electric ventilator.

Available in two finishes:

No. 100-A: Selected white oak, in light medium oak satin finish.

No. 100-B: Birch, mahogany finish.

Overall height, 84¾"; width, 30½"; depth, 30½". Shipped knocked down and crated.

Illustrated literature available.

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For telephone men who prefer the best.

The Cook A-9u Lavite fuse is rated to blow on a 50% overload within 5 minutes.

This is in accordance with Underwriters' specifications and this fuse is listed with the Underwriters' Laboratories.

Cook also manufactures a full line of fuses carrying "Telephone Rating." These fuses blow instantly at their rated capacity.

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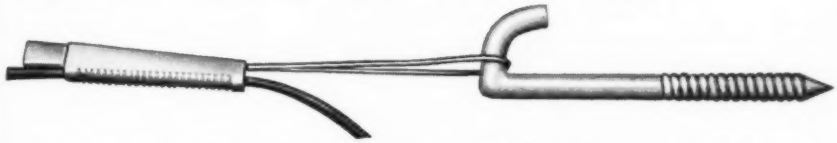
reliable *drop wire clamps*



***Manufactured by* RELIABLE ELECTRIC COMPANY**

TYPE "P"—for No. 17 parallel reinforced. Holds drop wires at moderate tensions, but concentrates pressure on small area under heavy loads.
TYPE "PS"—for No. 17 and 18. Particularly for smaller, weaker wires. Even under breaking loads the "PS" supports drop without damage.

Reliable Drop Wire Clamps are unique in that they:

1. Prolong life of drop wires by permitting free swinging at the support, placing all wear on the hardware.
2. Permit stringing and sagging of service drops before cutting wire.
3. Automatically tighten under load, assuring a firm grip without damaging insulation.
4. Eliminate sharp bends in wire.

"Reliable identifies the quality"

everstick anchors

. . . are designed to meet the most rigid anchoring and guying specifications.

The patented EVERSTICK Nut Housing locks anchor firmly on rod, making installation simple under all conditions and permitting easy recovery of the rod. Note well-designed, heavily constructed sections of metal in base plate.

EVERSTICK Expanding Plates are *ribbed* to double their original strength; their cutting edge and wedge shape arm socket reduces earth resistance to a minimum and assures easy expansion.

Three-Way EVERSTICK with expanding plates—contacts solid earth at every point around base plate, giving full benefit of earth's holding power.

Spreader Arms extra heavy ribbed with ball and socket joint at top and clinched socket on expanding plates allow heavy bearings to move freely with minimum friction, insuring easy expansion which eliminates buckling or breaking of arms.

EVERSTICK Anchor

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Wire Construction And Maintenance

(Concluded from page 17)

Several years ago, the idea of using five-pair Neoprene jacketed cable was conceived, to replace runs of four or five drop wires to small apartment houses, mostly of the four-family construction. For a period of time, it was possible to obtain the cable from concerns selling surplus stocks of wire and cable used in military installations. This cable consists of five pairs of No. 19 gauge latex insulated copper conductors with a heavy Neoprene jacket. Because of its heavy weight, it is necessary to string free spans of cable with approximately twice the sag of spans of standard drop wire.

Some companies suspend free spans of the drop cable by means of cable grips (Kearney Lacit-type). It is understood that there has been little or no trouble with damage to the cable at the suspension points. The only trouble experienced, so far, was the damage to the latex insulation of the individual conductors inside the cable terminal from drop wires pulled into or out of the terminal on subsequent installations. To avoid this trouble, a five-pair terminal mounting has been developed for installation in a position adjacent to the cable terminal, to terminate the drop cable. Bridle wire jumpers are used from the terminal mounting to the cable terminal.

The drop span is attached to the building by means of house bracket with "S" knob. The building run is supported on 2-R porcelain cleats and terminates in a five-pair protector mounting, which is equipped with standard fuses and protector blocks.

The drop cable has other valuable uses, chiefly as extensions on lead-covered cable or on open-wire lines. When used as an extension on lead-covered cable, it saves the placing of an expensive and critical item, where only a few subscribers are to be served and drop wires would not be satisfactory on account of their appearance or bad tree conditions.

In situations where tree interference is severe along an open-wire lead and permission cannot be obtained to remove the interfering trees and shrubs, the five-pair cable can be used to replace the section of open wire through the trees.

When used in pole-to-pole spans, the drop cable spans should be limited to 125 feet and have not less than four feet of sag. If the spacing of the line poles is too great, Class 10 poles may be set between the line poles for additional support.

The conversion to dial, installation of an increasing number of carrier circuits, and a very sensitive public, due to higher rates, has created a much higher degree of maintenance of our telephone plants than was required a few years ago. We should recognize these facts, in an attempt to reach our objective or providing an economical and efficient grade of telephone service.

V V

Dept. of Labor Reports Average Earnings of Telephone Employes

In a telephone industry report of hours and earnings for October, 1951, published by the U. S. Department of Labor, it is indicated that the average weekly earnings of switchboard operating employes amounted to $51.45. This compares with $48.98 during October, 1950.

A further comparison reveals that average hourly earnings have increased from $1.276 to $1.361 while average weekly hours have decreased from 38.4 to 37.8 during the 12-month period.

Included in the group of employes to which the data relates are those in such occupations in the telephone industry as switchboard operators, service assistants, operating room instructors and paystation attendants. Although no information is available as to the number of employes included in this group for October, 1951, the report states that such employes made up 46 per cent of the total number of non-supervisory employes in the 540 telephone companies reporting hours and earnings data in 1950.

Average weekly earnings of line construction, installation and maintenance employes amounted to $83.54 in October, 1951, as compared with $75.95 during October, 1950. Average hourly earnings of this group increased from $1.426 to $1.532 and average weekly hours decreased from 39.4 to 39.1 since October, 1950.

Included in this group of employes are those in such occupations as central office craftsmen, installation and exchange repair craftsmen, line, cable and conduit craftsmen and laborers. During 1950 these employes made up 25 per cent of the total number of non-supervisory employes in telephone establishments reporting hours and earnings data to the Bureau of Labor Statistics of the Labor Department.

POLE LINE SUPPLIES

DOUGLAS FIR CROSSARMS—AIR SEASONED

62" 6 pin 2¾"x3¾" Pony Crossarms, per 100 ..... 175.00
82" 8 pin 2¾"x3¾" Pony Crossarms, per 100 ..... 205.00
102" 10 pin 2¾"x3¾" Pony Crossarms, per 100 ..... 261.00

AMERTEL 12/85 galvanized line wire in stock for immediate delivery

OAK BRACKETS

1½"x2"x10" Oak Brackets, per 100 ..... $5.00
2"x2⅜"x12" Oak Brackets, per 100 ..... 8.52

GLASS INSULATORS
H-9 Pony, per 100 ..... $6.60
H-16 L.D., per 100 ..... 8.58

"LOCKE" POLE LINE HARDWARE

7020 20" Crossarm Braces, per 100 ..... $22.06
7024 24" Crossarm Braces, per 100 ..... 26.03
7030 30" Crossarm Braces, per 100 ..... 31.97

SIEMENS-MARTIN GUY STRAND
¼ in., per 1000 ft. $26.93
5/16 in., per 1000 ft. 36.81
(500 ft. coils)

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1760 LUNT AVENUE CHICAGO 26, ILLINOIS

R. B. Gray, Three Others Promoted by Northwestern Bell

Election of R. B. Gray as vice president in charge of rates and revenues has been announced by Northwestern Bell Telephone Co.

Gray succeeds Glenn Allen, vice president, who will hereafter continue as vice president in charge of public relations.

Gray began with the company at Storm Lake, Iowa, in 1924, and has served as district manager, commercial superintendent and assistant to the president.

Other changes in the executive staff of the company include naming of D. R. Colby as assistant secretary and treasurer; R. A. Devereaux as assistant to the vice president, personnel relations, in Iowa; W. E. Pothen to succeed Devereaux as commercial manager for South Dakota, and E. W. Shaw as plant manager for Nebraska.

Answers to Questions on Page 22

(1) Yes. If the calling party is holding the line when you secure the number from another operator, repeat it to him at the first interval of waiting or just before a report; if the calling party is not holding the line, always give the number just before a report, saying for example, "On your call to (called place), (address name)'s number is (no.), if you care to make a note of it," followed by the report.

(2) Start timing as soon as you hear the called telephone answer or, if switchhook supervision is received from the called telephone, as soon as the telephone answers as determined from the cord signal, and at once cut out.

(3) A five-second timing allowance will apply.

(4) I would say it is necessary to learn to handle long distance calls to be classified as an experienced operator, if such calls are handled in your exchange and it is necessary to have this experience to qualify for supervisory work. More information on this subject will be found in the preface to the questions and answers.

(5) Yes. Failure to follow this procedure will frequently result in a waste of toll circuit usage, operator's time, and it may also result in annoyance to the called station or party.

HANG THE LOAD ON HUBBARD HARDWARE

HUBBARD STRAIN PLATES

Hot Galvanized

No. 7575

No. 7576

No. 7577

Hubbard Strain Plates protect pole fibres from being cut by messenger or guy strand. They are furnished standard (No. 7575); with offset to fit 1-1/4-inch maximum diameter ground wire moulding (No. 7576); and with guy hooks (No. 7577). All styles have nail holes. No. 7577 has one 11/16-inch guy hook hole and two 7/16-inch lag screw holes. All are hot galvanized.

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Trouble-free service
in any weather

Extreme temperatures, cold snaps, or sudden thaws can't damage Armstrong's Glass Insulators. Laboratory tests and line experience have proved these rugged insulators will withstand thermal shocks far more severe than any encountered in actual service.

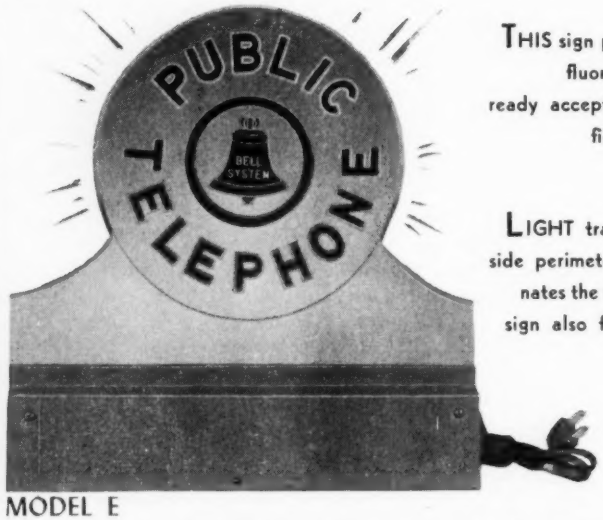
Armstrong's Glass Insulators are hand-gauged at the factory for uniform accuracy of thread contour—they fit pins perfectly. They will support long spans of ice-laden lines, carrying loads which can bend standard metal mounting pins. Evenly molded, these insulators have smooth, flat seams and can be handled with complete safety—even without work gloves!

Find out how Armstrong's Glass Insulators can help you cut maintenance and replacement costs. Contact your supplier or write direct to Armstrong Cork Company, Glass and Closure Division, 295 Fifth Avenue, New York 16, N. Y.

ARMSTRONG'S GLASS INSULATORS
for communications . . . for power

illuminated SIGNS

***Do* Produce Additional Revenue for Pay Stations**



MODEL E

THIS sign powered with a 10 Watt fluorescent tube is finding ready acceptance in the Telephone field. It directs traffic to the pay station.

LIGHT traveling around the outside perimeter of the circle, illuminates the wording on the sign. This sign also furnished with engraved directional arrows.

If desired the word "Service" instead of Bell system, will be furnished.

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F. A. Hoffman Named Plant Chief for Indiana Associated

Frank A. Hoffman, formerly associated with International Telephone & Telegraph Co., was appointed general plant superintendent of Indiana Associated Telephone Corp., effective Jan. 2.

Following his graduation from Sibley School of Mechanical Engineering,

F. A. HOFFMAN

Cornell University, in 1925, he became a student engineer with International Telephone & Telegraph Co., and was assigned to the Cuban Telephone Co. Later he was transferred to Spain as supervisor of cable construction and splicing on a nation-wide buildup of a new telephone system. Other work in Spain included organizing and training the Spanish staff of the plant engineering department in work on electrolysis mitigation measures, and working on engineering and construction of buried toll cables in the Spanish network. Hoffman continued in the plant department for 14 years, becoming assistant general plant superintendent before leaving Spain in December, 1941.

The following year he became plant superintendent in Porto Alegre, Brazil, and then became general manager in Curitiba, Parana, Brazil. In December, 1946, he was assigned as general plant superintendent of Mexican Telephone & Telegraph Co., Mexico City.

A year later he went to Buenos Aires, Argentina, as IT&T's technical adviser on plant matters for the Argentine government telephone administration.

In March, 1951, he was assigned to the leader contract department of Federal Telephone & Radio Corp., dealing with government contracts for radio communication for the armed services.

XUM

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★ ★

THE ANALYSIS AND PRESENTATION OF ENGINEERING PROBLEMS
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Plant Training Supervisor, Southern Bell Telephone & Telegraph Co.

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if
our name
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in this great nation
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King Awards Medal to Bennett Of Automatic of Liverpool

In the 1952 King George VI of England's Honors List, published on New Year's day, appears the name of A. Frank Bennett, director and joint general manager of Automatic Telephone & Electric Co. Ltd., Liverpool, England. Bennett has been awarded the C.B.E. (Commander of the British Empire).

Bennett was born in Iowa. After completing a high school course and a year in civil engineering at Cornell, he studied electrical engineering for three years at Iowa State College in Ames. In 1902 he joined Automatic Electric Co., Chicago, and worked in the laboratories under the late A. E. Keith at the time the Keith line switch was produced, and with the late E. A. Mellinger on the conversion of the Strowger automatic telephone system to common battery working. He was, however, chiefly concerned with work in the field, and in the period from 1903 to 1910 supervised the installation of and brought into service 10 new automatic exchanges in as many cities throughout the United States, Canada and Hawaii.

Following a further 10 years engineering experience with the Chicago company, both in laboratory and field, Bennett, in 1920, joined Automatic Telephone Manufacturing Co. Ltd., Liverpool, England, becoming chief engineer of that organization a year later. He was made a director in 1932 and manager in 1940.

A. FRANK BENNETT

Bennett's career has been marked by a number of achievements. The most important of these was the invention in 1922 of the "director," which rendered it possible for the Strowger automatic system to be applied to the needs of London and other large cities in Great Britain and throughout the world, and the subsequent negotiations with the British Post Office which led to this body adopting the Strowger system as standard for Great Britain.

The award of the C.B.E. has, in all probability, been on the recommendation of the British Post Office in recognition of these and other services which Bennett rendered to that administration over the years he resided in Great Britain.

In the Orders of the British Empire which the King bestows upon his civilian subjects for distinguished public services to the empire, or for contributing notably to the welfare of the empire through their daily work, the C.B.E. is the most senior below Kt.G.C. (Knight Grand Cross) and Kt.C. (Knight Commander), which carry with them the title "Sir" as a prefix to the recipient's name. The lower orders are O.B.E. (Officer of the British Empire) and M.B.E. (Member of the British Empire).

The insignia of the C.B.E. is a ribbon worn around the neck only at formal dinners and functions, from which is suspended a medallion consisting of an imperial crown in gold surmounting a cross, the whole surrounded by a circlet.

V V

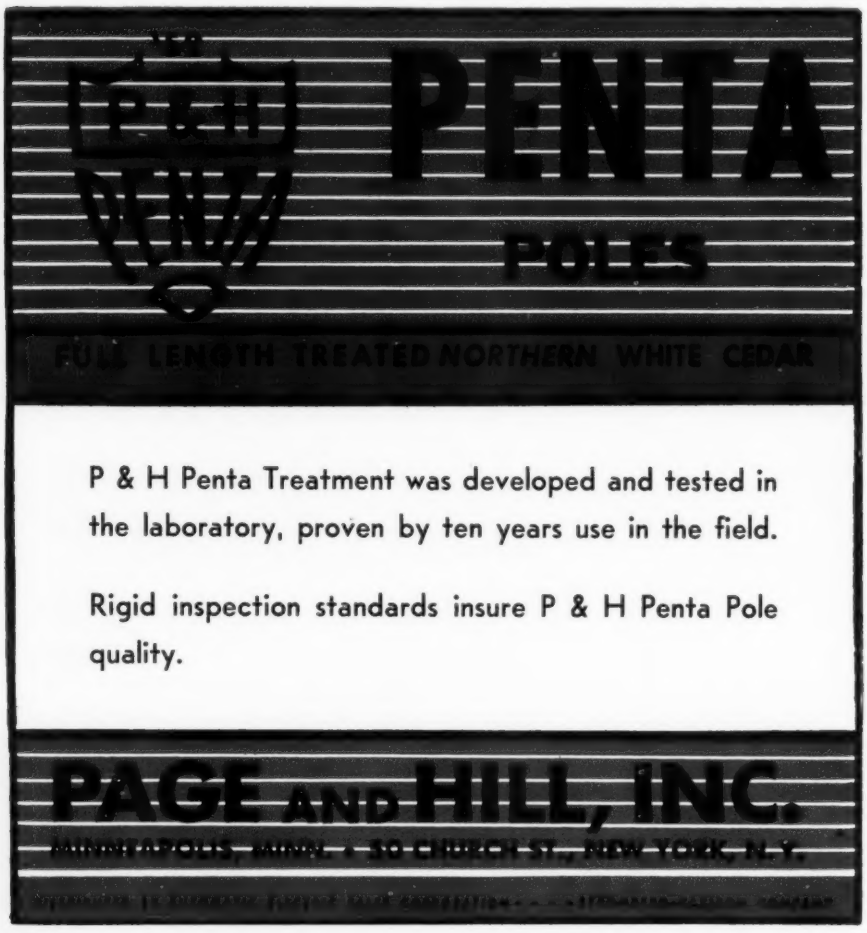
AT&T Reports Telephone Network Strengthened in 1951

The Bell System's network was strengthened in 1951 to meet growing defense and civilian needs, according to an American Telephone & Telegraph Co. report in its review of progress during the telephone's 75th anniversary year.

Highlights of the Bell System construction program included opening of a seventh coast-to-coast voice highway over which telephone calls and television signals are relayed by radio beam; the start, on a trial basis in Englewood, N. J., of customer dialing of long distance calls, and the addition of 2,100,000 telephones during the year.

The cross-country radio relay route was opened for telephone service on Aug. 17. The first transcontinental television program was carried over the new system on Sept. 4, when America saw the historic Japanese Peace Treaty Conference.

The Englewood trial makes it possible for 10,000 telephone users in the New Jersey suburb to dial 11 million telephones in areas as far away as San Francisco. Direct dialing of toll and long distance calls by operators also continued to increase, with 38 per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cent of all long haul calls being handled in this manner in 1951.

Bell telephones in use rose to 37,500,000, double the number in service 10 years ago. However, demand for telephone service continued to grow and the construction program to be carried out next year will be another big one if materials can be obtained, the company said. Bell companies have on their books at the end of the year almost 800,000 orders for new service and 1,800,000 orders from party line customers for service that better meets their needs.

Long distance traffic was greater than in any previous year, averaging over 6 million calls a day. Several hundred thousand miles of toll circuits were installed in 1951 to help handle these calls.

Cleo F. Craig, president of AT&T, said that national defense continues to be the first order of business with the Bell System. In addition to meeting the communications demands of the armed forces, Bell telephone companies pushed their program to assure essential service during emergencies. This program includes arrangements for shunting telephone traffic around disaster points, provision of standby power units at all central offices, utilization of mobile radio and portable telephone units at strategic locations during emergency, and plans for restoration of essential lines of service.

Financial history was made in May when the number of owners of AT&T stock reached the million mark, first time that any company has achieved such broad ownership.

Craig stressed the need for adequate rates and sufficient supply of raw materials in 1952. "To do their big job well, telephone companies must keep themselves financially strong," he pointed out. "This means that the charges for telephone service must be adequate and, whenever they are not sufficient, they need to be made so."

Touching on the materials situation, the AT&T president said that "this essential industry must be able, in the months ahead, to obtain the raw materials its needs. Every effort is already being made to conserve critical materials and to employ substitutes wherever practicable."

V V

>> Efforts to control prices and wages, no matter how zealously and efficiently enforced, will be futile precisely to the extent that this nation fails to remove the inflationary steam under the boiler now. — *Joint Committee on the Economic Report.*

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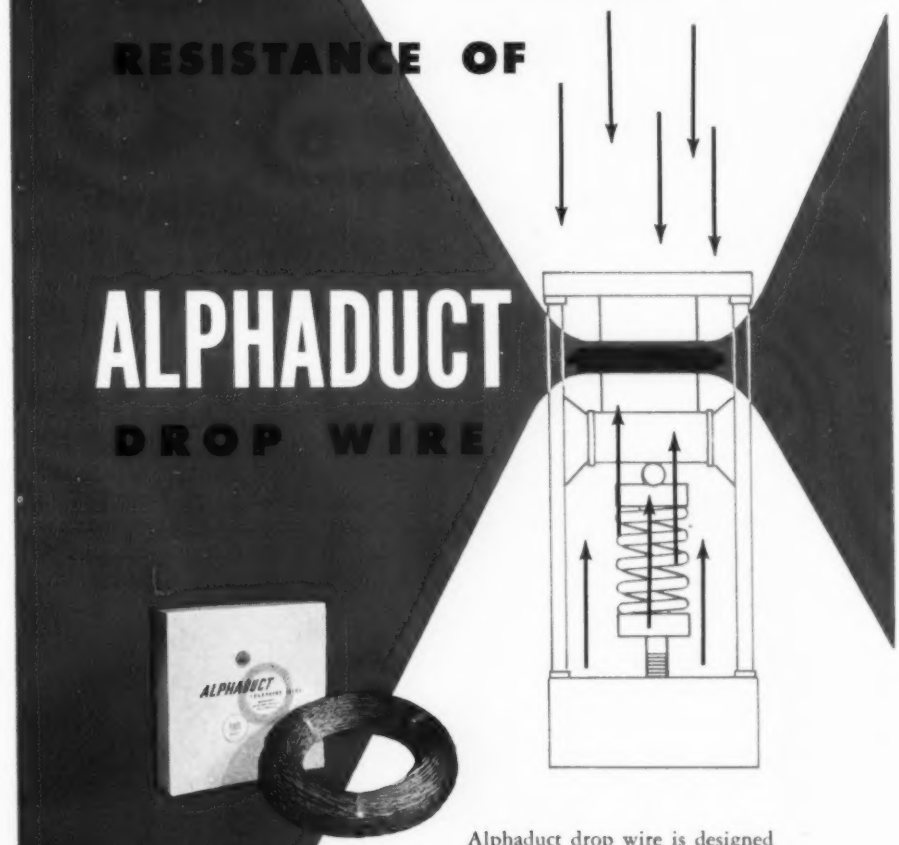

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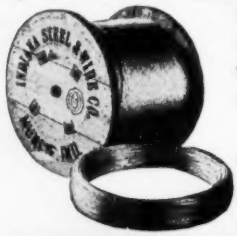

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WRITE FOR SAMPLES AND QUOTATIONS

Hubbard Announces Guy Strand Clamp

Hubbard & Co., 6305 Butler St., Pittsburgh 1, Pa., announce the Hubbard ServiSleev, a spring clamp that is

designed to hold the loose end of a guy strand firmly to the guy. (See cut). It eliminates time-consuming methods of wrapping with a separate piece of wire or tape or with strands of the loose end, the company says.

The ServiSleev is formed from heavy galvanized steel, and has a belled end. It is slipped over the loose end of a guy with the belled end toward the clamp, and is tapped into position with any convenient tool. According to the company, the installation takes only four or five seconds and gives a neater appearance and protection.

V V

Kellogg Appoints TESCO Ltd. Canadian Representative

Kellogg Switchboard & Supply Co., Chicago, announced on Jan. 25 the appointment of TESCO, Ltd. of Toronto and Montreal as its Canadian representative.

TESCO (Telephone Equipment & Service Co.) will engineer and sell Kellogg telephone equipment in Canada.

Bell System Telephone Gain For 1951 Approaches 2,100,000

The Bell System added 560,000 telephones in the fourth quarter of 1951; this brought the gain for the year to nearly 2,100,000 — substantially more than the 1950 increase of 1,955,000, Cleo F. Craig, president, American Telephone & Telegraph Co., reported on Jan. 4.

The number of toll and long distance messages in 1951 also was above all previous records. Bell System telephones in service now total more than 37,400,000.

Expenditures of the Bell System for new construction in 1951 exceeded a billion dollars. Nevertheless, overall demand for service is so great that the heavy load on telephone facilities has been further increased. A very large construction program must be continued, and more materials are required than the telephone companies are currently able to obtain, Craig stated.

Increases in costs during the year—principally higher wages and higher taxes—substantially exceeded increases in telephone rates. Still higher costs are in prospect, and additional increases in rates are needed to maintain adequate earnings, on which the continuing expansion and improvement of telephone service will always depend. The Bell System companies are therefore continuing to apply for increases in rates as necessary, the AT&T president said.

V V

North Announces New Catalog

North Electric Manufacturing Co., Galion, O., has announced publication of its latest catalog of the company's telephones. It contains up-to-date information on North's standard line of desk sets, wall telephones and special instruments in color. Also included are detailed specifications, replacement parts identification and ordering information. W. M. Aiken, North general sales manager, says copies are available upon request.

Southwestern States Telephone Co., Brownwood, Tex., recently cut over to dial its Gladewater exchange. Pictured above is the new building housing the dial equipment.

XUM

Henry C. Roemer Named President of Federal

Henry C. Roemer was named president of Federal Telephone & Radio Corp., manufacturing associate of International Telephone & Telegraph Corp in Clifton, N. J.

A director and vice president of Federal Telephone since 1940, Roemer was appointed executive vice president in September, 1950. As president he succeeds Gen. William H. Harrison, who will remain only as president of IT&T.

Roemer joined the IT&T system in 1927 in the parent company's comptroller's department. He became chief accountant in 1930 and assistant comptroller in 1932. For five years he was in charge of accounting and finance for IT&T manufacturing associates in Great Britain and Europe.

He was elected a director of IT&T in 1943, a vice president in 1944, and comptroller two years later.

Roemer is vice president and a director of several IT&T subsidiaries and also is on the board of Telefonos de Mexico, S.A.

V V

Raytheon Announces Contest To Find Oldest RectiChargeR

A nation-wide search for the oldest RectiChargeR now in actual use has been announced by Raytheon Manufacturing Co., Waltham, Mass.

The telephone company now operating the *oldest* RectiChargeR will receive a new latest model RectiChargeR to replace the old one, while the maintenance man making the discovery will receive a 100 dollar United States Defense Bond.

Participants can easily determine the age of a Raytheon RectiChargeR by checking the serial number on the name plate. The smaller the number, the older the RectiChargeR.

Those who wish to join Raytheon in its search for the oldest RectiChargeR should write for further details to: Raytheon Manufacturing Co., Dept. 6470 NR, Waltham 54, Mass.

V V

E. R. McCoy Heads Joslyn Sales

E. R. McCoy, for 18 years with the sales department of Joslyn Mfg. & Supply Co., was appointed sales manager recently. He joined Joslyn in 1934 at the Omaha office and moved to Chicago as assistant sales manager in 1946. He is entering his 32d year in the electrical industry.

McCoy moves into the position vacated by M. M. "Irish" Kenneally, who

E. R. McCOY

will act as sales consultant to the company on a part time basis. Kenneally expects to spend the balance of his time at his new home in Mt. Dora, Fla., thus winding up 36 years in the industry. He began his career with Iowa Public Service Co., and prior to joining Joslyn in 1944, served with Ohio Brass Co. and Porcelain Insulator Co.

This year Joslyn celebrates its 50th anniversary as manufacturers of line equipment for the transmission and distribution of electrical power. The company was organized in Chicago by M. L. Joslyn in 1902.

L. E. DURHOLT has been named manager of Hemingray Insulator sales effective at once, according to J. P. Kearney, American Structural Products Co., Toledo, O. Durholt replaces Minot Holmes, who will retire shortly after having served Hemingray for 47 years. Durholt joined Owens-Illinois Glass Co., parent of American Structural Products, in 1929. He was with the former company's Libbey Division until 1947, when he joined American Structural Products Co. In his present post he will be responsible for the insulator business covering sales to communications and power customers. Although Hemingray insulators are manufactured in Muncie, Ind., Durholt's headquarters will be in Toledo.

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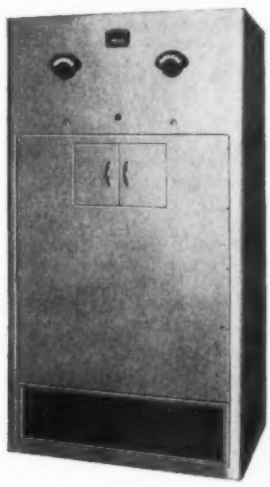

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CABLE SPLICER, LINEMAN, INSTALLER, 25 years' experience; age 43; married. Prefer southwest but will go any place. Write Box No. 3145, c/o TELEPHONY.

EUROPEAN REPRESENTATIVE —After about May 1st, I shall be located in Zurich, Switzerland. I shall be pleased to represent your interests there or elsewhere in Europe. Experienced in telephone designing, manufacturing and operating fields. All transactions confidential. Address Box No. 3146, c/o TELEPHONY.

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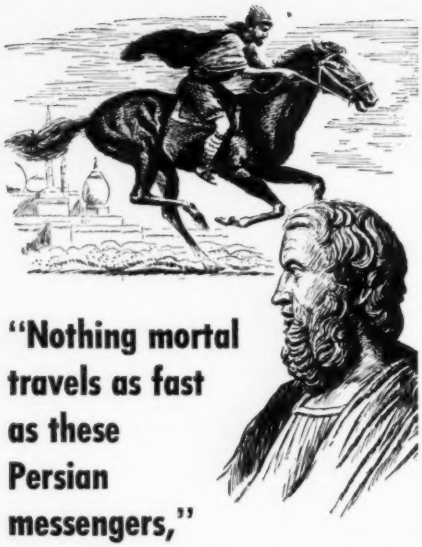

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